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THE

VICTORIAN NATURALIST:

THE JOURNAL & MAGAZINE

OF THE

Field Naturalists' Club of Victoria.

VOL. XXXVIII.

MAY, 1921, TO APRIL, 1922.

Hon. Editor: MR. F. G. A. BARNARD.

The Author of each Article is responsible for the facts and opinions recorded.

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CONTENTS.

FIELD NATURALISTS' CLUB OF VICTORIA :— PAGE

Annual Report - - - - - 18

Exhibition of Wild-flowers - - - 61

Nature Study Exhibition - - 28, 47

Proceedings 1, 9, 17, 25, 37, 45, 57, 71, 83, 103, 119, 131

Reports of Excursions 1, 9, 25, 37, 45, 57, 71, 83, 86, 88, 91, 119, 122, 131

ORIGINAL PAPERS.

AUDAS, J. W., F.L.S.—Through the Balangum Ranges and at Rose's Gap - - - - 4, 11

AUDAS, J. W., F.L.S.—Description of a New Trymalium (with plate) - - - - - 34

BLACKBOURN, B.—Some Observations on Mantids - 30

CHAPMAN, F., A.L.S.—The Geology of the Mallee - 124

HART, T. S., M.A.—The Gippsland Lakes Country: Physiographical Features (with plate) - 75

HILL, JAMES—Notes on the Migratory Locust and the Invasion of 1880 - - - - 40

HORNE, G., V.D., M.D.—Aboriginal Coast Camps of Eastern Victoria (with plate) - - 48

OKE, CHARLES—A Day's Beetle-Collecting at the Lerderderg - - - - - 93

PESCOTT, E. E., F.L.S.—Notes on Mueller's Literary Work - - - - - 98

TADGELL, A. J.—A Contribution to "The Flora of the Victorian Alps" - - - - 105

TOVEY, J. R., and MORRIS, P. F.—Notes from the National Herbarium of Victoria, including a Description of a New Species of Brachycome (with plate) - - - - - 135

WILSON, F. ERASMUS—An Entomologist in Southern Queensland - - - - - 54, 64

INDEX.

PAGE

Aboriginal Coast Camps - 48
Alpine Plants - - - 112
Alps, Flora of Victorian - 105
Audas, J. W., F.L.S.—Through Balangum Ranges and Grampians - - 4, 11
Audas, J. W., F.L.S.—Description of *Trymalium ramosissimum* 34
Australian Museum Magazine - - - - 102
Balangum Ranges - - 4
Barnard, F. G. A.—Mueller's Botanical Exploration of Victoria - - - 59
Beaumaris, Excursion to - 1
Beetles at Lerderderg - 93
Beetles, Bendigo - - 88
Bendigo, Excursion to - 86
Birds at Eltham - - 90
Blackbourn, B.—Observations on Mantids - 30
Boronia, Excursion to - 57
Brachycome Tadgellii . - 135
Butterfly, Notes on Caper 85
Chapman, F., A.L.S.—Geology of Mallee - 124
Cheltenham, Excursion to 45
Cole, C. J.—Notes on Caper Butterfly - - - 85
Corysanthes bicalcarata - 27
Daley, C., F.L.S.—A Sketch of Mueller's Life - - - - 58
Daley, C., and Williamson, H. B.—Trip to Sources of Murray - 132
Dandenong Ranges - 8
Eagles and Hawks - - 44
Echidnophaga ambulans - 123
Eltham, Excursion to - 88
Entomologist in Southern Queensland - 54, 64
Eucalyptus neglecta - - 104
Exhibits *re* Baron von Mueller - - - 60

PAGE

Field Naturalists' Club of Victoria—
Alteration of Rules - 37
Annual Report - - 18
Excursions—
Beaumaris - - 1
Bendigo - - - 86
Boronia - - - 57
Cheltenham - - 45
Eltham - - - 88
Enid Nursery - - 131
Essendon - - 17
Frankston - - 91
Greensborough - 17
Healesville - - 71
Lilydale - - - 122
Macedon - - - 9
Mitcham - - - 57
Paradise - - - 71
Ringwood - - 45
Tooradin - - - 83
Walhalla - - - 119
Warragul - - - 84
Werribee Gorge - 57
Yalourn (Morwell) - 120
You Yangs - - 72
Zoological Gardens - 119
Exhibition of Wildflowers - - - 61
Financial Statement - 22
Nature Study Exhibition 25, 47
Office-bearers, 1921–2 - 24
Proceedings 1, 9, 17, 25, 37, 45, 57, 71, 83, 103, 119, 131
Flea, A Rare - - - 123
Fossils, Frankston - - 92
Fossils, Yeringian - - 122
Frankston, Excursion to - 91
Frog, A Preserved - - 72
Frog in Pine Tree - - 35
Gippsland Lakes, Physiography of - - 75
"Golden Wattle" - - 45
"Grampians, Views of" - 130
Grampians (Rose's Gap) - 11

PAGE
Grass, Australian Species of Stipa - - - 10
Hart, T. S., M.A.—Physiography of Gippsland Lakes - - 75
Hawks, Eagles and - - 44
Healesville, Excursion to - 71
Herbarium, Notes from National - - - 135
Hibiscus Farrangei - 104, 135
Hill, Jas.—Notes on Migratory Locust - 40
Horne, G., M.D.—Aboriginal Coast Camps of Eastern Victoria - 48
Jones, Owen, B.A.—Our Forests - - - 46
Lees, The late E. H., C.E., F.R.A.S. - - 36
Lepidoptera Presented to National Museum - 74
Lerderderg, Beetle Hunting at - - - 93
Lilydale, Excursion to - 122
Lobelia simplicicaulis - 132
Locust, The Migratory 2, 40
Lord Howe Island - - 97
Macedon, Excursion to - 9
Mallee, Geography of - 127
Mallee, Geology of - - 124
Mallee National Park, A - 63
Mantids, Observations on 30
M'Lennan, The late J. P. 36
Menzies Creek, Reservation of - - - 83
Microscopes, New British 33
Mitcham, Excursion to - 57
Morwell Coal Mine - - 120
Mount Gambier - - 137
Mueller Night - - - 58
Mueller's Botanical Exploration of Victoria 59
Mueller's Life, A Sketch of 58
Mueller's Literary Work - 98
Mulder, The late J. F. - 138
Murray, Trip to Sources of - - - - 132
Mutton-Bird and Foxes - 2
Naturalist's Paradise, A - 97
"New Zealand Ferns" - 133
Oke, C.—Beetle Hunting at Lerderderg - - 93
PAGE
Ooldea Plants - - 128
Orchid New for Victoria - 27
Orchid, *Spiranthes australis* - - - 104
"Organ Pipes," Visit to - 2
Papilio sthenelus - - 73
Paradise, Excursion to - 71
Pescott, E. E.—Mueller's Literary Work - - 98
Plants, Alpine - - 112
Plants, Bendigo - - 87
Plants from Ooldea - - 128
Plants, New Victorian 27, 34, 104
Polyporus mylittæ - - 103
Queensland, Entomologist in Southern - 54, 64
Ringwood, Excursion to - 45
Rose's Gap (Grampians) 7, 11
Shells, Tube - - - 38
Smith, The late Frank S. 123
Spider, A Pretty - - 85
Spiranthes australis - - 104
Stipa, The Genus - - 10
Tadgell, A. J.—Flora of Victorian Alps - - 105
Tasmanian F.N. Club - 35
"The Gum-Tree" - - 3
Tooradin, Excursion to - 83
Tovey, J. R., and Morris, P. F.—Notes from National Herbarium - 135
Trymalium ramosissimum 34
Tube Shells - - - 38
Victorian Plants, New 27, 34, 104, 135
Walhalla, Excursion to - 119
Warragul, Excursion to - 84
Werribee Gorge, Excursion to - - - - 57
"Wild-flowers of Western Australia" - - 134
Wilson, F. E.—Entomologist in Southern Queensland - 54, 64
Yalourn, Excursion to - 120
Yeringian Fossils - - 122
Young, The late Jas. H. 123
You Yangs, Excursion to - - - - 71
Zoological Gardens, Excursion to - - 119

ILLUSTRATIONS.

PAGE

Aboriginal Camps - - - - - - 49

Brachycome Tadgellii, sp. nov. - - - - 135

Gippsland Lakes - - - - - - 82

Trymalium ramosissimum, sp. nov. - - - 34

ERRATA.

Page 10, line 15 from bottom—For "*Centaurea*" read "*Erythræa*."

Page 17, line 2 of report—For "20th" June read "13th."

Page 47—See paragraph headed "Correction."

Page 104, line 27—For "*Farragel*" read "*Farrangei*."

Page 121, line 11 from bottom—For "*Lagenaria*" read "*Lagunaria*."

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The Victorian Naturalist:

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— OF —

The Field Naturalists' Club of Victoria.

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CONTENTS:

PAGE

Field Naturalists' Club of Victoria 1

Through the Balangum Ranges and at Rose's Gap (Grampians). By J. W. Audas, F.L.S., F.R.M.S., National Herbarium, Melbourne... 4

Notes 3, 8

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1921.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 9th MAY, 1921.

1. Correspondence and Reports.

2. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

3. Election of Members.

As Ordinary Member—	Proposer.	Seconder.
Mr. H. R. Stevens, 1 Mont Albert Road, Canterbury.	Mr. F. Chapman, A.L.S.	Mr. J. A. Kershaw, F.E.S.
As Associates—		
Master Keith L. Carnegie, Studley Avenue, Kew.	Mr. A. D. Hardy, F.L.S.	Mr. F. G. A. Barnard.
Master Hugh R. Syme, "Rockingham," Barker's Road, Kew.	Mr. A. D. Hardy, F.L.S.	Mr. F. G. A. Barnard.

4. General Business.

   Election of two Auditors.

   Nominations (in writing) of Office-Bearers for 1921-22.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for examination of Exhibits.

   Exhibits are specially desired for this meeting.

6. Reading of Papers and Discussion thereon.

   By Dr. G. Horne—"Some Aboriginal Stone Implements." (Illustrated by lantern slides.)

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

ANNUAL MEETING.

Owing to the Exhibition of Specimens having been arranged for Tuesday, 14th June, the Annual Meeting will be held on **third** Monday—20th June.

The Victorian Naturalist.

Vol. XXXVIII.—No. 1. MAY 5, 1921. No. 449.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 11th April, 1921.

The president, Mr. J. Gabriel, occupied the chair, and about sixty members and visitors were present.

REPORT.

In the absence of the leader, Mr. F. Cudmore, a report of the excursion to Beaumaris on Saturday, 9th April, was given by Mr. A. L. Scott. The afternoon was boisterous, and unfortunately the tide did not suit for an examination of the fossil beds; however, Mr. Cudmore explained the geological history of the locality, and, having brought with him a number of specimens collected at Beaumaris, he was able to demonstrate to the party the relationship existing between the extinct species and allied forms still living in Port Phillip Bay. Included in the specimens were Cetacean vertebræ, teeth of the Porcupine Fish (Diodon), Ray (Myliobatis), and a Dolphin (Steno), also numerous sharks' teeth, representing about twenty species. Notwithstanding the disappointment of no actual search for fossils, the party spent an interesting afternoon, resolving to try and arrange another outing to the locality soon.

ELECTION OF MEMBER.

On a ballot being taken, Mr. H. Walker, Torrington-street, Canterbury, was duly elected a member of the Club.

GENERAL BUSINESS.

Reference was made to the forthcoming exhibition of specimens, in conjunction with the Microscopical Society. Mr. D. Best said that the Club ought to be able to make an attractive exhibition without the help of another society. It was pointed out by Messrs. F. Chapman and F. Pitcher that the Microscopical Society had been of great assistance to the Club on several occasions in connection with the exhibitions of wild-flowers, and they thought that a combined exhibition would prove of great public interest. On the motion of Messrs. Wilcox and Sutton it was resolved—"That, in view of the great assistance received from the members of the Microscopical Society in past years, the proposal of the committee to hold a combined exhibition be approved of." Messrs. Gabriel, Pitcher, Barnard, and Williamson were

appointed as a sub-committee to act in conjunction with a sub-committee of the Microscopical Society.

Mr. C. Gabriel said that members would be pleased to learn that the Mutton-birds at Phillip Island were being protected, and that up to date seventy-five foxes had been destroyed.

Dr. Sutton, in reply to a question, said that the Plant Names Committee had experienced delay in getting the final revision of the list completed. He thought, however, that there was sufficient money in hand for the publication of the volume.

PAPERS READ.

1. By Mr. B. Blackbourn (communicated by Mr. C. French, jun.), entitled "Some Observations on Mantids."

In the absence of the author, the paper was read by Mr. C. Oke. The author stated that his notes referred to the common Green Mantis of our gardens. Specimens of these he had obtained when very small, and carefully watched their growth until almost the adult stage. Interesting particulars were given of the casting of the skin as they increased in size, and of the injury to limbs and their replacement.

Mr. E. Keep said that he had kept mantids in captivity, and could corroborate many of the statements made in the paper.

Mr. H. B. Williamson drew attention to a statement in the *Argus* nature notes recently that mantids drained the juices out of flies, leaving only the dry skin. Mr. C. Oke said this could not be true, as mantids were provided with mouths for biting, not sucking.

2. By Mr. Jas. Hill, entitled "Notes on the Migratory Locust, and the Visitation of 1886."

In the absence of the author the paper was read by Mr. C. Oke. The author gave an interesting account of the arrival of the locusts at Kewell (Wimmera district) in the summer of 1886, the laying of the eggs, the hatching, casting of skins, and general habits of the insects.

Mr. H. B. Williamson said that he had experience of a similar flight of locusts in the North-Eastern district.

The chairman remarked that he had seen similar swarms in Central Victoria, and mentioned that at the time trains had been stopped owing to the crushed insects preventing the engines from gripping the rails. He said that the Ibis and Galah (Rose Cockatoo) had done great work in eating the eggs, and so reducing the next season's numbers.

NATURAL HISTORY NOTE.

Mr. A. J. Tadgell gave some notes of an Easter afternoon at the "Organ Pipes," near Sydenham, which, he said, were easily reached by a good walker, remarking that the enthusiast in

botany, geology, or photography would find much to interest him there. Though the wrong time of year for flowers, he had noted 155 species of native and introduced plants, some in flower, such as *Pelargonium Rodneyanum*, *Senecio Cunninghami*, and *Ixiolena leptolepis*.

EXHIBITS.

By Mr. C. J. Gabriel.—Victorian marine shells, *Fasciolaria australis*, Perry, also var. *fusiformis*, Val., and var. *Bakeri*, Gatliff and Gabriel; also egg capsules of the same.

By Mr. A. J. Tadgell. — Dried specimens of *Scutellaria humilis*, from just above high water mark at Beaumaris; Gooseberry Cucumber, *Cucumis myriocarpus* (introduced), from Jackson's Creek, Sydenham; Knotweed (introduced), *Polygonum aviculare*, and a very similar plant, Whitlow-wort, *Paronchia Chilensis*, a native of Chili, from Sunbury, Sydenham, Frankston, &c.; also *Plectranthus parviflorus*, Cockspur, from East Gippsland, a handsome decorative plant.

By Mr. L. Thorn.—Larvæ in various stages of the Emperor Moth, *Antheræa eucalypti*, with pupa cases and perfect insects.

By Mr. J. R. Tovey.—Introduced plants—*Cirsium Syriacum*, Gaertn., "Syrian Thistle," from Mansfield district, R. G. Dundas, Dec., 1920: a native of the Mediterranean regions, not previously recorded for Victoria: proclaimed under the *Thistle Act* for the whole State. *Medicago echinus*, D.C., "Calvary Medick or Crown of Thorns," Drysdale district, December, 1920, from the Mediterranean region, in process of naturalization in Victoria. *Salpichroa rhomboidea*, Miers, "Pampas Lily of the Valley," a native of South America, recorded from Black Rock, Burnley, and Camberwell: this plant was erroneously recorded in *Proc. Roy. Soc. Vict.*, vol. xxxi. (1919), p. 377, under name of *Withania somnifera*, Dun., which does not occur in Victoria.

After the usual conversazione the meeting terminated.

"THE GUM TREE." — The March issue of this quarterly (vol. vi., No. 17) is to hand. Mr. A. G. Campbell writes on "The Economic Value of Australian Birds to Australian Forests," pointing out that a large number of Australian insects are timber destroyers, hence all insect-eating birds should be fully protected. An interesting illustrated account is given of the Powelltown mill and its activities. We regret to see that Dr. C. S. Sutton, who has been hon. secretary of the Forest League since its inception, has, through lack of time, been obliged to relinquish the position. Mr. Guy P. Smith has been appointed to the vacant post.

THROUGH THE BALANGUM RANGES AND AT ROSE'S GAP (GRAMPIANS).

By J. W. AUDAS, F.L.S., F.R.M.S., National Herbarium, Melbourne.

(*Read before the Field Naturalists' Club of Victoria, 14th March*, 1921.)

LESSER known than the Grampians, the Balangum Ranges, situated about thirty-five miles north-east of Stawell, are well worthy of a visit by the nature-lover, be he interested in agriculture, botany, or geology. I had long desired to visit the locality, and, having arranged with my friend, Mr. Charles D'Alton, to join me in October last, we proceeded by jinker from Stawell to Callawadda on the 25th of that month. Stawell, a famous mining centre, once known as Pleasant Creek, still boasts one great mine, the Magdala (one of the deepest in Victoria), which has been working continuously for over 50 years, and employs some two hundred men. The district around shows traces on all sides of mining operations in days gone by.

The original site of the gold rush at Pleasant Creek is about a mile outside the town, where not a house remains (the population having centred more closely to the railway), a monument now marking this famous spot; but Stawell, though its mining industries have declined almost to extinction, cannot be said to have felt the loss, for it has reaped the riches of the immense fertile Mallee agricultural areas which have become settled and populated around it. For about eight miles surrounding the town the country is just ordinary scrubby bush land whereon we noted nothing worthy of interest, except, perhaps, the beautiful show of blooms on the Common Fringe-Myrtle, *Calytrix tetragona*, which spreads over acres, and quite justified its claims to rank high as a decorative plant. At Campbell's Bridge we crossed the Wimmera River, and emerged on the flat agricultural area, rich in fertility, and stretching onward to the once-despised Mallee country, now regarded as the backbone of our State. The course of the Wimmera, flowing through this almost treeless area, could be traced far into the distance by the foliage of the Red Gum trees, *Eucalyptus rostrata*—fine specimens flourishing over the rich black loam of the river flats.

Of paramount importance in raising the value and increasing the carrying capacity of poor Mallee country is the "Wimmera" Rye-grass, *Lolium subulatum*, which has been extensively planted during the last few years. Save for the one great fault of too free propagation, it seems to possess every other virtue necessary to improve the carrying capacity of the land. This grass is supposed to be a native of Southern Europe, and very

closely resembles Italian Rye-grass, *L. italicum*, but with a few marked differences. For instance, it does not exhibit the large woolly awns of the latter; instead, its long, rigid outer glumes hold the seed tightly compressed, and the seed itself is much fuller and more plump than that of rye-grass. The purplish tinge noticed on the young stems of rye-grass is, in the case of *L. subulatum*, continued and intensified towards maturity, giving a paddock of this grass a very noticeable difference in appearance. It may be said to give sustenance all the year, for, coming into growth with the first autumn rain, it furnishes green feed from about April to December, and the dry stubble may be grazed for the remaining months. It also makes first-class ensilage when green, and good hay when properly cured. The mainstay of success with it, however, seems to be a knowledge of control: but, in my opinion, it must be considered a blessing, were it only to redeem the interminable acres which are now given over to Helipterums or Sunrays, of which three species predominate—viz., *H. floribundum*, *H. Cotula*, and *H. corymbiflorum*—which seem to be spreading of late years, for the country on all sides, at this period of the year, appeared like a huge white sheet, spotted only in low-lying places by the bright magenta blossoms of the Trailing Swainsona, *S. procumbens*. This plant does indeed contain much nutritive food, and can be safely grazed with other fodder; but the Helipterums, as is well known, cause impaction.

Leaving Callawadda with a number of friends at an early hour the following morning, we drove to the foot of the Balangum Ranges, the first interesting object *en route* being the Callawadda State timber reserve of 2,000 acres, which has been cleared of fallen timber and fenced for conservation by the Forestry Department. It consists almost exclusively of the Grey Box, *Eucalyptus hemiphloia*, with a light sprinkling of Blue Gum, *E. globulus*. Near the crossing of the Richardson River was seen a considerable quantity of Bull Oak, *Casuarina Luehmanni*, one of our most beautiful Australian timbers, which was named by Mr. R. T. Baker, F.L.S., in honour of my late chief, Mr. J. G. Luehmann, Government Botanist. This tree grows, on an average, to 60 feet, sometimes attaining 100 feet, with a diameter of 1½ to 2 feet. It has a clear stem of deeply-furrowed bark, which is very easily stripped from the trunk. The wood in the heart of the trunk is deep red, shading off towards the outer edges in pale pinkish tones, and giving a very handsome effect when used in cabinet work, especially when cut on the transverse. Its branchlets give sustenance to all kinds of stock, and it is frequently felled for that purpose in times of drought.

Much low-lying sandy soil, almost exclusively covered with sedges, here abounds, and presents a very burnt-off appearance, due to the black-coloured spikelets of these plants, of which the principal species is the Black Sword-Sedge, *Lepidosperma carphoides*. They are not eaten by stock, but may have some value as fibre plants. It was due to their unattractiveness as fodder that I was fortunate in securing an orchid new to Victoria amongst them, which otherwise would no doubt have been eaten off. This was *Calochilus paludosus*, closely allied to *C. campestris*, but of more slender growth and fewer flower-heads. Innumerable small annual composite plants were here seen, the most prolific being Dwarf Woolly-Heads, *Myriocephalus rhizocephalus*, Flannel Cudweed, *Gnaphalodes uliginosum*, Wiry Buttons, *Leptorrhynchos tenuifolius*, Orange Sunray, *Helipterum Jesseni*, and Small Wrinklewort, *Rutidosis pumilio*.

At the Ballapur State school we left the main road and turned through a forest of eucalypts for about three miles before reaching the Balangum Ranges. Here we noted the Long-leaf Box, *Eucalyptus elæophora*, Apple Box, *E. Stuartiana*, Yellow Box, *E. melliodora*, and the Narrow-leaf Peppermint, *E. Australiana*. The rather skimpy undergrowth was composed of Soft Bush-Pea, *Pultenæa mollis*, Entaxia, *E. empetrifolia*, Showy Parrot-Pea, *Dillwynia floribunda*, Rough Parrot-Pea, *D. hispida*, Slender Rice-flower, *Pimelea linifolia*, Erect Guinea-flower, *Hibbertia stricta*, Silky Guinea-flower, *H. densiflora*, and Red Correa, *Correa speciosa*. Proceeding through this forest country I collected two orchids, *Caladenia reticulata* and *C. leptochila*, the former being new to Victoria. Both these species have been carefully described by Fitzgerald, the famous orchidologist of New South Wales, in his monograph on Australian orchids. They were included by Baron von Mueller under the species *Caladenia Pattersoni*, but latterly have been recognized under the classification of the late Mr. Fitzgerald. Many orchids of lesser note were also collected, viz.:—Brownbeards, *Calochilus Robertsoni*, Large Tongue Orchid, *Cryptostylis longifolia*, Dotted Sun Orchid, *Thelymitra ixioides*, Horned Orchid, *Orthoceras strictum*, Short-lipped Leek Orchid, *Prasophyllum brevilabre*, Bearded Tongue Orchid, *Pterostylis barbata*, Hare Orchid, *Caladenia Menziesii*, and Slender Caladenia, *C. angustata*—the latter being new to Victoria when I first found it at the "Wild-flower Garden" of the Grampians in 1918. Near the foot of the ranges are seen, still standing, the old poppet-heads of the once famous Kingston mine, and the country round about shows evidence of having been extensively mined. A peculiar and striking feature was the prevalence of two shrubs which invariably persist in country of auriferous formation; they were the

Golden Wattle, *Acacia pycnantha*, and a small shrub, the Peach Heath, *Lissanthe strigosa*. These may be noted by any ordinary observer on many of our goldfields—for instance, in the country round Bendigo and Ararat. The soil, as may be inferred, was very poor, and the timbers stunted, but there was certainly a feast for the orchidologist, if not for any ordinary botanist. It would be impossible to mention or describe all the orchids which grew in profusion, despite the poorness of the soil. Among others I noted Austral Lady's Tresses, *Spiranthes australis*, Gnat Orchid, *Cyrtostylis reniformis*, Scented Lyperanthus, *Lyperanthus suaveolens*, Musky Caladenia, *Caladenia testacea*, Pink Fingers, *C. carnea*, Larger Glossodia, *Glossodia major*, Pink Sun Orchid, *Thelymitra carnea*, Yellow Sun Orchid, *T. antennifera*, and the rare and gorgeous Red Sun Orchid, *T. Macmillani*.

The famous Red Ironbark, *Eucalyptus sideroxylon*, so useful for heavy bridges and culverts, was the principal timber on the ranges, but had hardly attained sufficient growth for commercial purposes. Other eucalypts were Red Stringybark, *E. macrorrhyncha*, Grey Box, *E. hemiphloia*, Yellow Box, *E. melliodora*, Long-leaf Box, *E. elæophora*, and Apple Box, *E. Stuartiana*, of equally stunted growth. In such a poor locality one scarcely expects to find rarities, but nevertheless we discovered the Alternate-leaf Flat-Pea, *Platylobium alternifolium*, Leafy Templetonia, *T. Muelleri*, Phyllota, *P. pleurandroides*, and the less rare but still attractive and beautiful Grevilleas, *G. lavendulacea* and *G. rosmarinifolia*, both of which merit the attention of horticulturists. Of heaths there were not many, but we found fine specimens of *Epacris impressa*, var. *grandiflora*, on which both the foliage and flowers were much larger than usual. A straggling little shrub, *Scævola æmula*, belonging to the Goodeniaceæ, was blooming; its heliotrope flowers could hardly be considered beautiful when seen singly, but here, at this time, it was in such profusion as to be very striking indeed. It must have a very long flowering period, for it was October, 1920, when we saw it here, and quite three months later (18th January, 1921) I came across it again in flower at Yarra Junction.

Not finding the Balangum Ranges as interesting as anticipated, we returned to Callawadda, and decided to inspect an area of the Grampians which we had not yet visited, and therefore set out next day for Rose's Gap, about fifteen miles westward. It was well on towards mid-day before we reached the Gap, and called at a bee farm, owned by Mr. Edson, prettily situated on a clearing just beneath a point of the Grampians known as Briggs's Bluff. Here we arranged accommodation for a day or two while we inspected the beauty spots of the locality. In the afternoon we proceeded to the Fall, away

behind the homestead, passing on the way a large cave caused by water erosion of sandstone. On its walls were inscribed many hundreds of names—a permanent register of visitors to the locality. The Fall has a sheer drop of a hundred feet over sandstone cliffs, and when there is a sufficiency of water must be a fine sight; but at the time of our visit the volume of water was very small. Along the creek leading from the Fall we collected the following shrubs in flower—viz., Star Hair, *Astrotricha ledifolia*, Twiggy Daisy, *Olearia ramulosa*, Clustered Everlasting, *Helichrysum semipapposum*, Scented Groundsel, *Senecio odoratus*, Hairy Correa, *C. æmula*, and Round-leaf Mint-bush, *Prostanthera rotundifolia*. On the cliffs at either side of the Fall we noticed *Leptospermum lanigerum*, var. *myrtifolium*, which has beautiful, large, attractive flowers, and is locally called "Wild Apple-blossom." It is one of the tea-trees, grows quickly and easily, and should prove worth the trouble of introducing into the flower garden. On precarious positions here and there above the Fall were Showy Bauera, *B. sessiliflora*, Rough Mint-bush, *Prostanthera denticulata*, Hairy Mint-bush, *P. hirtula*, Hairy Bush-Pea, *Pultenæa villosa*, and Golden Goodia, *G. lotifolia*. Flourishing in profusion at the foot of the Fall were the King Fern, *Todea barbara*, intermixed with Fan Fern, *Gleichenia lævigata*, Wire Fern, *G. dicarpa*, and Fishbone Fern, *Lomaria discolor*.

(*To be continued.*)

THE DANDENONGS AND RAIDERS.—In an article in the *Argus* of Saturday, 2nd April, Mr. Donald Macdonald points out the necessity for increased vigilance by nature-lovers if the beautiful gullies of Melbourne's greatest heritage, the Dandenong Ranges, are to be kept in anything like their original state. Unfortunately, tourists are not entirely to blame for the state of things, which is becoming more serious every day. The egg-collector, who collects "in the interests of science," is a menace to certain of the rarer birds. He mentions that no less than twenty clutches of Rose-breasted Robins' eggs have been taken by one "collector" this season! Surely such collecting must be done for trading purposes, and some means should be found to stop the practice. The taking of ferns also despoils the beauty spots. Little harm would be done if visitors confined their gatherings to small seedlings, easily found, but the average tripper takes large plants, which only languish and die when removed to the drier atmosphere of the metropolis. Attention is also called to the operations of the Forests Department, which seem likely to rob the forest of some of its finest specimens, on the grounds of making the reserve pay for its upkeep. Cannot something be done to preserve some of the large trees for the benefit of visitors from other lands?

Vol. XXXVIII.—No. 2. June, 1921.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

Published 2nd June, 1921.

Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

PAGE

Field Naturalists' Club of Victoria 9

Note 10

Through the Balangum Ranges and at Rose's Gap (Grampians). By J. W. Audas, F.L.S., F.R.M.S., National Herbarium, Melbourne... 11

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1921.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR ANNUAL MEETING

MONDAY EVENING, 20th JUNE, 1921.

1. Correspondence and Reports.

2. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

3. Election of Members.

As Ordinary Member—	Proposer.	Seconder.
Mr. Aubrey E. Atkyns, Studley Park Road, Kew.	Mr. A. D. Hardy, F.L.S.	Mr. F. G. A. Barnard.
Mr. Claude R. Kerr, Swanston Street, Melbourne.	Mr. J. Searle.	Mr. J. Gabriel.
As Country Member—		
Mr. Murray Moodie, Nareen, *Via* Coleraine.	Mr. F. Pitcher.	Mr. A. MacCaskill.
Mr. Thos. C. Bryan, "Lahana," P.O., Molesworth.	Mr. F. Chapman, A.L.S.	Mr. F. G. A. Barnard.

4. General Business.

(*a*) Consideration of Annual Report and Financial Statement for 1920-21.

(*b*) Election of Office-Bearers for 1921-22.

The following nominations have been made :—

President :—Mr. F. Chapman, A.L.S. ; Mr. C. Daley, B.A.

Vice-Presidents (two) :—Mr. C. Daley, B.A. ; Mr. E. E. Pescott, F.L.S. ; Mr. J. Searle.

Hon. Treasurer :—Mr. F. Pitcher.

Hon. Librarian :—Mr. P. R. H. St. John.

Hon. Editor :—Mr. F. G. A. Barnard.

Hon. Secretary :—Mr. C. Oke.

Hon. Assistant Secretary and Librarian :—

Committee :—Messrs. C. Barrett, C.M.Z.S., G. Coghill, F. Cudmore, J. Gabriel, A. D. Hardy, F.L.S., J. A. Kershaw, F.E.S., E. E. Pescott, F.L.S., Dr. C. S. Sutton, A. J. Tadgell, H. B. Williamson, and F. E. Wilson. (Five to be elected.)

NOTE.—Subscriptions for 1921-22 must be paid in order to qualify for voting.

5. Remarks by Exhibitors relative to their Specimens.

Ten minutes' adjournment for examination of Exhibits.

6. Reading of Papers and Discussion thereon.

By Mr. J. W. Audas, F.L.S.—"Description of a New Trymalium (N.O. Rhamnaceæ)."

7. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

The Victorian Naturalist.

Vol. XXXVIII.—No. 2. JUNE 2, 1921. No. 450.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 9th May, 1921.

The president, Mr. J. Gabriel, occupied the chair, and about seventy members and visitors were present.

CORRESPONDENCE.

From the private secretary to His Excellency the Earl of Stradbroke, stating that Lord and Lady Stradbroke would be pleased to be present at the nature study exhibition on 14th prox.

REPORT.

A report of the visit to the Macedon State Nursery on Saturday, 23rd April, was given by Mr. C. Daley, F.L.S., who acted as leader in the unavoidable absence of the leader, Mr. A. D. Hardy, F.L.S. He stated that the party had spent a most interesting forenoon, and were greatly indebted to the officer in charge of the nursery, Mr. J. Firth, for a very instructive demonstration of the contents and methods of carrying on the nursery. In the afternoon a brief visit was paid to Messrs. Taylor and Sangster's nursery, where a large variety of ornamental trees and shrubs were seen in all the glory of their autumn-tinted foliage.

On the motion of Messrs. Daley and Sutton, the hon. secretary was directed to convey to Mr. Firth the thanks of the Club for his kindness on the occasion.

In referring to the outing, Mr. A. D. Hardy, F.L.S., stated that the Forests Commission had a large number of tree seedlings which it would be pleased to distribute to country residents at nominal rates.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. H. R. Stevens, 1 Mont Albert-road, Canterbury, was elected as an ordinary member, and Messrs. Keith L. Carnegie, Studley-avenue, Kew, and Hugh R. Syme, Barker's-road, Kew, as associate members.

GENERAL BUSINESS.

Nominations were made for office-bearers for the year 1921–22, and Messrs. A. J. Tadgell and F. Wisewould were elected to audit the accounts for 1920–21.

EXHIBITION ITEM.

Mr. H. B. Wilkinson moved that it be a recommendation to the committee that a refund of out-of-pocket expenses be made

to senders of wild-flowers to the forthcoming exhibition. This was seconded by Mr. C. A. Lambert and carried.

PAPER READ.

By Dr. G. Horne, entitled "Some Aboriginal Stone Implements."

The author gave an interesting account, illustrated by lantern slides, of various kinds of implements, and the localities where they may be likely to be found.

Several members took part in a brief discussion which followed.

EXHIBITS.

By Mr. C. Barrett, C.M.Z.S.—Specimens of *Helix desertorum*, from Giza, Egypt. This snail is noted for great tenacity of life. The supposed shells of two specimens, collected in 1846, were gummed to a tablet and placed in the British Museum. In 1850 they were removed and placed in water, when one of the snails emerged, and next day fed upon a cabbage-leaf.

By Mr. F. Chapman, A.L.S.—Conodonts, teeth of worms, Devonian, from Erie County, New York, U.S.A.

By Mr. F. Cudmore. Aboriginal stone implements from Darling district, Western New South Wales, and from Morgan, South Australia.

By Miss G. Nokes.—Three autumn orchids from Sandringham —viz., Tailed Green-hood, *Pterostylis pedaloglossa*, Tiny Green-hood, *P. parviflora*, and Fringed Caladenia, *Caladenia fimbriatus*.

By Mr. A. J. Tadgell. Specimens of Stinkwort, *Inula graveolens*, collected at Sandringham, 7th May, 1921.

By Mr. J. R. Tovey, on behalf of National Herbarium. Proclaimed weed, *Carthamus glaucus*, Bieb., "Glaucous Star-thistle," a native of Egypt, Asia Minor, and Persia, collected at Kowree by Mr. R. Lamond; also *Centaurea australis*, R. Br., Austral Centaury (Gentianaceæ), a white-flowered form from Pemberton, W.A., collected by Max Koch: normal form, native of all the States of the Commonwealth.

After the usual conversazione the meeting terminated.

THE GENUS STIPA (GRAMINEÆ).—Twenty-four pages of No. 1 (1921) of the *Bulletin of Miscellaneous Information*, issued by the Royal Botanic Gardens, Kew (England), are devoted to a revision of the Australian species of the genus Stipa, with the result that the fifteen species of the "Flora Australiensis" have been expanded to forty (Mueller listed nineteen in the "Second Census of Australian Plants," 1889). The work has been done by Miss D. K. Hughes, who has arranged the species into nine groups. Six pages of illustrations, figuring the spikelets and sections of the leaves, accompany the paper.

THROUGH THE BALANGUM RANGES AND AT ROSE'S GAP (GRAMPIANS).

By J. W. AUDAS, F.L.S., F.R.M.S., National Herbarium, Melbourne.

(*Read before the Field Naturalists' Club of Victoria*, 14*th March*, 1921.)

(*Continued from page* 8.)

Next morning we decided to examine the surrounding hills, taking the main track which leads through Rose's Gap to the Wartook Reservoir. However, as we did not wish to continue to the Wartook Reservoir, having visited it previously, we turned off in a northerly direction, and struck across for Shepherd's Gap, which runs parallel to Rose's Gap. One quickly realizes how this spot received its name, for it is most beautiful country, lightly timbered, and stretched away in soft, rolling, grassy slopes. At one point the red sandstone cliffs rise to a height of several hundred feet in towers and terraces, giving the appearance of a beautiful old castle. From the lovely view to be obtained at the top we named it "Shepherd's Lookout." On the way we gathered a number of shrubs, one of which we thought at first was *Hibbertia densiflora*, but on closer examination it proved to be a rutaceous plant, the Downy Starbush, *Pleurandropsis phebalioides*; it grows to a height of eighteen inches, has bright yellow flowers, and rather uncommon foliage. Another rutaceous plant, and a very beautiful one, which we had not previously collected in the Grampians, was the Small-leaved Wax-flower, *Eriostemon difformis*. It has small pinkish-white flowers, grows to a height of about two feet, and is closely related to our much-loved native Boronia. Another rather rare plant I had not previously found personally on the Grampians, but which, no doubt, may have been collected by others, was the Large-leaf Ray-flower, *Anthocercis Fadesii*. It is a small, erect shrub of three or four feet, with small white flowers and hairy foliage. After much hard climbing over this very isolated and difficult area, when crossing a gully we came upon the Hairy Hop-bush, *Dodonæa boronifolia*, which has foliage somewhat resembling *Boronia pinnata*, but flowers like those of the Common Hop-bush. Flourishing also in the gully was the Heathy Parrot-Pea, *Dillwynia ericifolia*, var. *glaberrima*. The ordinary form of this species met on average soil does not grow above six feet, but this variety, which is invariably found in gullies or near water, attains a height of fifteen feet, and its leaves are much more numerous and its flowers more compact and larger than those of the ordinary form. The country was still very rough and difficult, but we forged ahead in a northerly direction, and reached a peak from which we obtained a most

glorious panoramic view of the country for an immense distance. Directly opposite, towering up like a sentry guarding the entrance to Rose's Gap, was Briggs's Bluff, beneath which was the residence in which we had passed the previous night. Lake Lonsdale and Mount Dryden could be seen in the far distance. To the west was the Wartook Reservoir, and to the north the fine new artificial lake, Lake Taylor (30,000 acre feet), which has just been completed to provide water for the Mallee by the State Rivers and Water Supply Commission.

High up among the hills, before descending, we found a small shrub, which has always been known as *Pultenæa styphelioides*, but which Mr. H. B. Williamson, who is making a revision of the genus Pultenæa, considers is not correct; he purposes to publish it as a new species, to be called *P. costata*. Its erratic habit of growth has possibly added some doubt as to its validity, for while normally it grows into a compact shrub, occasionally it will be found trailing along the ground. There were also here, high among the rocks, two orchids which are sufficiently important to merit some mention. The former was discovered for the first time by Mr. E. E. Pescott and myself at Mount Difficult in October, 1913, and was considered to be *Caladenia congesta*; but Dr. Rogers, of Adelaide, after very mature consideration, has lately published it as a new species, which he has named *C. iridescens*. It is of most unusual and beautiful bronze colouring, and seems to flourish only high up in the barren, stony mountain soil. The other is *Thelymitra megcalyptra*, one of the Sun Orchids: its flowers are blue when growing, but turn pink when dried. This orchid has been previously recorded for New South Wales, but this was the first occasion on which it had been found in Victoria. We discovered it in very interesting circumstances. In a small crevice on top of a large rock there were quite a hundred flowers, and it was evident that the plants must have been there a very long time, having no doubt multiplied from the first seed.

When descending the range on the eastern side we came upon a solitary bush of *Sphærolobium daviesioides*, a leguminous shrub with spiny branchlets, growing to a height of three feet, and having small brownish-red flowers. A little lower down we found two more leguminous plants: they were the Dwarf Wedge-Pea, *Gompholobium minus*, and the Dwarf Bush-Pea, *Pultenæa humilis*. The former is the more attractive of the two on account of its extremely vivid green foliage and bright red flowers, similar to in shape, and quite as large as, Sweet Peas. The foliage of the latter is very woolly, and its yellowish-red flowers are not so large, but it grows much taller than the Gompholobium. Another plant of proteaceous

form, the Mountain Conosperm, *Conospermum Mitchelli*, formed patches here and there, and, as the shrubs were in flower, presented a fine appearance. When not in flower they are exactly similar to young pine-trees, but later they become covered with masses of white, cauliflower-like flower-heads.

Passing along the foot of the ranges, we passed through acres of Crimson Kunzea, *K. parvifolia*. It was in full bloom, and made a striking show, with its fluffy crimson flowers, among which we discovered one plant bearing white flowers. On the swampy flats quite a large number of myrtaceous plants flourished, many being fine ornamental shrubs, three we noted in bloom being the Cross Honey-Myrtle, *Melaleuca decussata*, Slender Honey-Myrtle, *M. gibbosa*, and Scarlet Bottle-brush, *Callistemon rugulosus*. The latter is, perhaps, the most ornamental, its spikes of bright red flowers being about six inches long, and has well-shaped foliage of very striking appearance. On rising ground, as we again ascended the ranges, we crossed over some heathy country and collected the Blue Tinsel Lily, *Calectasia cyanea*, an everlasting shrub, which attains a height of about two feet. Here we noticed a freak of Nature—a Yellow and Grey Box had become united in one tree, but having different root systems.

Returning towards Briggs's Bluff, we had to force our way through veritably acres of the Shrubby Velvet-bush, *Lasiopetalum dasyphyllum*, a sterculiaceous plant which grows about ten feet in height. It is very handsome, the large leaves, about four inches long, being deep green on top and russet brown beneath, and its rather inconspicuous flowers are of the same russet hue. On a stretch of clear country approaching the homestead we collected about a dozen specimens of very minute plants, some so tiny as to render it necessary to go on one's hands and knees to find them. The names of those collected are:—Tiny Bladderwort, *Utricularia lateriflora*, Tufted Centrolepis, *C. fascicularis*, Smooth Centrolepis, *C. glabra*, Wiry Centrolepis, *C. polygyna*, Hairy Centrolepis, *C. strigosa*, Dwarf Aphelia, *A. pumilio*, Slender Aphelia, *A. gracilis*, Hairy Stylewort, *Levenhockia dubia*, Tiny Sunray, *Helipterum exiguum*, Small Trigger-plant, *Stylidium despectum*, Spurred Trigger-plant, *S. calcaratum*, Slender Trigger-plant, *S. perpusillum*, and the Bristly Trigger-plant, *S. soboliferum*. The latter is a most attractive little plant. It grows in thick mossy mats, sends up a straight stem about three inches high, which bears a tiny pink blossom. It would certainly make a pleasing border for small garden beds if it could be cultivated. I should say it was hardy, as I came across it on very dry spots as well as moist, shaded places.

Next morning we set out on the return trip to Hall's Gap,

and in order to cover more country we chose a route leading southward in the direction of Lake Lonsdale. On a heathy patch we found rather a lot of the Mealy Honey-Myrtle, *Melaleuca squamea*. It is a beautiful little bush, with flower-heads very closely resembling *Kunzea parvifolia*, but slightly larger. Here we saw the famous Grampians plant, the Bushy Heath-Myrtle, *Thryptomene Mitchelliana*, growing literally by the acre, and of most prodigious growth: many shrubs—in fact, the majority of them—were twelve feet high, and spreading widely. It had finished flowering, and was in fruit, showing that the plants must flower much earlier on this part. It was comforting to see such a great area of this beautiful shrub, as on other parts of the Grampians it is in danger of being killed out by the inroads of civilization; here it would not be likely to become extinct. As we approached Dadswell's Bridge the Sallow Acacia, *A. longifolia*, was seen in abundance, extremely healthy plants, having exceptionally long phyllodes. It also had finished flowering. This species is known throughout the Grampians as "Dadswell's Bridge Wattle," and is greatly beloved by gardeners.

This locality is also "bee country." It is, indeed, the principal honey-producing area in Victoria. The timbers are the Yellow and Grey Box, so famous for flavouring honey. The flats were covered with Red Gums, but mostly young plants coming on, as this part was the scene of great sawmilling operations, now abandoned, as all the timber has been cut out. When crossing through the Ledcourt station we noticed a paddock which had not been grazed; it showed a prolific growth of Kangaroo Grass, *Anthistiria imberbis*; and, as showing how sheep eat out plants, we did not find on the grazed portions a single specimen of two plants which flourished in profusion on the ungrazed portions; they were the Large Vanilla Lily, *Dichopogon strictus*, and Yellow Lily, *Bulbine bulbosa*.

Throughout the morning we had been frequently passing over numerous channels constructed by the State Rivers and Water Supply Commission to distribute the waters of Lake Lonsdale, some of which traverse the country as far as Swan Hill, a distance of 200 miles. We stopped at Lake Lonsdale for lunch, and passed a little time inspecting the huge artificial bank. It is of great height, and a mile and three-quarters long. The lake has a large water capacity, being 45,500 acre feet, the flow to the channels being regulated by weirs. At the time of our visit the lake was full, the surplus water escaping with a great roar through two large cement pipes at the by-wash, where it fed the source of the Little Wimmera River.

Around Mount Dryden the Red Gum flats are the scene of quite a lucrative business—that of charcoal-burning. A number of kilns were burning, and I understand the output never catches up with the demand. The mount is of basaltic formation, and of such a hard nature that stone-crushing operations had to be abandoned. The only thing interesting in a botanical way was the Common Rock Fern, *Cheilanthes tenuifolia*, which grew in profusion, and softened the otherwise harsh stony appearance of the mountain. We noticed at the foot what we first thought to be a miniature form of the Stinkwort, *Inula graveolens*, but which proved, on examination, to be a native plant, the Comman Sunray, *Helipterum dimorpholepis*. In this locality the State Forest Department is clearing up the timber areas by thinning out all deformed trees. These are cut into firewood, and hundreds of tons are sent away by railway annually.

On the way back to Hall's Gap we passed another weir, constructed across a cut which enables the water of Fyans Creek to be turned either into Lake Lonsdale or Fyans Creek. This work is portion of the gravitation channel system, and has only recently been made. An immense bank, which runs along the roadside for many miles to protect the route from overflow, has also been completed. Nearing Hall's Gap, we passed through some nice Red Gum and Yellow Box country, and it was an unusual sight to see red flowers on the Yellow Box trees, which generally bear creamy-coloured blossoms. On a farm hereabouts (which, owing to overflow, had to be abandoned and was purchased by the Water Commission) it was interesting to note how rapidly the Wirilda, *Acacia retinodes*, had spread and taken complete possession of the so recently cultivated land. It was absolutely dense, and presented a very pretty appearance; its foliage is very bright green, and it possesses the unusual faculty of blooming all the year round.

The following morning we made a short excursion across the "Wild-Flower Garden" to Mokepilly Creek, and on the grassy patches we collected a number of orchids, including *Thelymitra carnea*, *T. flexnosa*, *T. epipactoides*, *T. pauciflora*, *Diuris sulphurea*, *D. pedunculata*, *Microtis parviflora* (new for the south-west), *M. atrata*, *Pterostylis rufa*, *P. barbata*, *Acianthus caudatus*, *Prasophyllum gracile*, *P. album*, and *P. odoratum*. The three latter are interesting. They have all been described by Dr. Rogers, *P. gracile* being new for Victoria, and *P. album* and *P. odoratum*, not previously found at the Grampians, are new for the south-west. Further on we advanced into timber country and collected some good specimens of the Flying Duck Orchid, *Caleana major*, also *Caladenia filamentosa*, *C. clavigera*, *Cyrtostylis reniformis*, *Acianthus caudatus*, *Praso-*

phyllum australe, P. elatum, P. patens, and *Thelymitra fusco-lutea.* Patches of heathy country further on were interspersed with *Banksia ornata* and the recently described *Melaleuca neglecta,* which was first collected by Mr. St. Eloy D'Alton. Returning by another route, we passed what was formerly known as the Black Swamp (17,000 acre feet), but which has been banked up and enlarged by the Water Commission, and is now called Lake Fyans. Here, in the swampy ground, we collected the Spreading Bush-Pea, *Pultenæa laxiflora,* Clustered Bush-Pea, *P. dentata,* Thready Bush-Pea, *P. Luehmanni,* Slender Conosperm, *Conospermum patens,* Shrub Violet, *Hybanthus floribundus,* and the sedges, *Gymnoschœnus adustus, Cladium schœnoides, Gahnia tetragonocarpa, Lepidosperma canescens,* and *Schœnus axillaris.* The fruit was well developed on *Hybanthus floribundus,* showing that it must have flowered particularly early. Helichrysums prevailed remarkably, there being literally acres of them, and the Woolly Everlasting, *H. Blandowskianum,* being predominant. It was in the budding stage, when the petals are glistening pink, and presented a very ornamental appearance.

The following day, accompanied by Mr. J. Cronin, Director of the Melbourne Botanic Gardens, and Mr. H. Rowe, of the Municipal Gardens, Stawell, we proceeded over a portion of Mount Difficult as far as the "Grand Canyon," which forms the entrance to "Wonderland." On this excursion we were greatly disappointed, as the bush fires had swept the locality, destroying everything but big standing timber, which will, no doubt, ultimately recover: but everything of lesser size was completely demolished. The whole trip revealed nothing interesting botanically, except, perhaps, a hill so completely covered with Blue Pincushions, *Brunonia australis,* that we named it Brunonia Hill. A rather uncommon sight was the parasite *Loranthus pendulus* on a Manna Gum sapling, *Eucalyptus viminalis.* It showed no stems whatever, but issued from the bark right up the trunk in thick sprouts; and on a late Black Wattle, *Acacia mollissima,* we noticed four mistletoes—viz., *Loranthus celastroides, L. pendulus, L. linophyllus,* and *L. Exocarpi.* I particularly made this excursion to gather fresh material of *Trymalium ramosissimum,* a species new to science, which Mr. D'Alton and myself had found the previous year, but after searching diligently was unable to secure the smallest specimen.

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CONTENTS:

PAGE

Field Naturalists' Club of Victoria—
Annual Report 17

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Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 11th JULY, 1921.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Miss Madeline Thompson, 26 Fawkner Street, St. Kilda.	Dr. J. A. Leach	Mr. C. Gabriel.
Miss Nettie Thresher, c/o Miss Jones, "Roubaix," Black Street, Middle Brighton.	Miss A. Fuller.	Miss G. Nethercote.
Mrs. T. V. Healy, "Cathay," Southey Street, Sandringham.	Dr. J. A. Leach.	Mr. C. Gabriel.
Mr. G. H. Shugg, Pensions Office, Elizabeth Street, Melbourne.	Mr. E. E. Pescott, F.L.S.	Mr. H. Clinton
Mr. J. M. Wilson, 57 Swanston Street, Melbourne.	Mr. F. Chapman, A.L.S.	Mr. J. A. Kershaw, F.E.S.
As Associate Member—		
Miss Margaret Swinburne, Kinkora Road, Hawthorn	Miss A. Fuller.	Miss G. Nethercote.

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

Notice of Motion by Mr. E. E. Keep—"That the rules of the Club be altered so as to provide that a retiring President becomes *ex officio* a member of the Committee for the following year."

5. Remarks by Exhibitors relative to their Specimens.

Ten minutes' adjournment for examination of Exhibits.

6. Reading of Papers and Discussion thereon.

By Mr. F. E. Wilson.—"An Entomologist in Southern Queensland."

7. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

The Victorian Naturalist.

Vol. XXXVIII.—No. 3. JULY 7, 1921. No. 451.

FIELD NATURALISTS' CLUB OF VICTORIA.

The forty-first annual meeting of the Club was held at the Royal Society's Hall on Monday evening, 20th June, 1921.

In the absence of the president through sickness, Mr. F. Chapman, A.L.S., one of the vice-presidents, was voted to the chair, and about sixty members and visitors were present.

REPORTS.

A brief report of the visit to the National Museum on Saturday, 2nd July, was given by Mr. C. Daley, F.L.S., who said that the members were met by the Curator of Zoology, Mr. J. A. Kershaw, F.E.S., who showed them portions of the reserve collections, including a portion of the "H. L. White Collection" of Australian bird-skins, the collections of invertebrates, &c. A very interesting afternoon had been spent, the members being astonished at the great amount of material available for workers.

A report of the excursion to Ferntree Gully on Monday, 6th June (King's Birthday), was given by the leader, Mr. F. Pitcher, who said that an enjoyable day had been spent in investigating the Gully, which, though showing the wear and tear of thousands of visitors annually, is still worthy of a visit by nature lovers. On leaving One Tree Hill, roads and tracks were followed *via* Ferny Creek to the neighbourhood of Upwey, and thence back to Ferntree Gully station. He had been pleased to find the ferns *Pteris tremula* and *Doodia* (*Woodwardia*) *caudata* in fair quantities.

ELECTION OF MEMBERS.

On a ballot being taken, Messrs. Aubrey E. Atkyns, Studley Park-road, Kew, and Claude R. Kerr, Swanston-street, Melbourne, were elected as ordinary members; and Messrs. Murray Moodie, Nareen, *via* Coleraine, and Thos. C. Bryan, "Labana," P.O., Molesworth, as country members of the Club.

NATURE LOVERS' EXHIBITION.

Reports were given by the organizers of the sections of the principal exhibits of their sections. All agreed that the exhibition had been very successful. Mr. F. Pitcher gave a brief statement of the finances, which so far indicated that there would be a surplus of about £50 for division between the Club and the Microscopical Society.

Members generally were satisfied with the effort, and votes of thanks were passed to His Excellency the Earl of Stradbroke

for opening the exhibition ; Miss Gabriel and ladies for attending to the refreshment department ; to the Royal Australasian Ornithologists' Union for the loan of exhibits ; and to the Forests Department for the display of forest products.

ANNUAL REPORT.

The acting hon. secretary, Mr. F. G. A. Barnard, read the forty-first annual report for the year 1920–21, which was as follows :—

"To the Members of the Field Naturalists' Club of Victoria.

"Ladies and Gentlemen,—In presenting the forty-first annual report of the Club for the year ended 30th April, 1921, your committee congratulate the members on the continued success of the Club.

"Commencing the year with a roll of 246 members, there were elected during the year 22 ordinary, 4 country, and 3 associate members, making a grand total of 275 ; but against this have to be made deductions for members who resigned or died, amounting to 16, leaving a net total of 259. The deaths were unsuually heavy, including Sir F. Madden, Rev. W. W. Watts, Messrs. R. A. Bastow, J. Booth, M.Sc., and H. Quiney. Reference to each of these was made in the *Naturalist* at the time. We also lost by death two honorary members, Messrs. E. D. Atkinson (Tas.) and Capt. T. Broun (N.Z.), thus reducing our honorary members' roll to two—Mr. A. H. S. Lucas, M.A., the first editor of the *Naturalist*, now of Sydney, and Lord Novar (Sir Ronald Munro Ferguson, G.C.M.G.)

"Owing to industrial troubles considerable interference to the regular monthly meetings and the publication of the *Naturalist* was experienced. The June and July (1920) meetings, as also the January and February (1921) meetings, had to be abandoned owing to lighting restrictions and the limited traffic allowed. The attendance, however, at those held was very satisfactory.

"The papers read numbered only ten ; they were :—May—'A Fifteen Years' Retrospect of the Club,' by Mr. F. G. A. Barnard ; August—'Introduced Animals,' by Mr. G. A. Keartland, and 'To the Alps for Coleoptera,' by Mr. D. Best ; September—'Three Anglers at the Murray,' by Mr. J. C. Goudie ; October—'New Victorian Orchids,' by Messrs. E. E. Pescott, F.L.S., and C. French, jun., also 'The Orchids of Victoria,' by Mr. E. E. Pescott, F.L.S. ; November—owing to a failure by the oxygen apparatus, an illustrated paper on the 'Geological History of Australian Plants,' by Mr. F. Chapman, had to be held over until December ; January and February, no meeting ;

March—'Through the Balangum Ranges and at Rose's Gap (Grampians)'; and April—'Remarks on Mantids,' by Mr. B. Blackbourn (communicated by Mr. C. French, jun.), and 'Notes on the Migratory Locust,' by Mr. Jas. Hill. Grouping the papers according to the subject-matter, they may be set down as follows:—Relating to mammalia, 1; entomology, 3; botany, 3; geology, 1; and general, 3.

"The excursions, one of the principal features of the Club, have been carried through with considerable success. Many localities in the vicinity of the metropolis have been visited, and their points of interest pointed out to members by the respective leaders; while places so far afield as Lerderderg, Bendigo, and Walhalla have also been visited. On the first-named excursion the members were deeply indebted to a fellow-member, Mr. C. C. Brittlebank, for the arrangements he had made, thus greatly adding to the interest of the outing. Your committee is deeply grateful to the leaders of excursions for giving the members the benefit of their knowledge of the localities chosen. A friend of the Club has handed to the treasurer the sum of £10, to be devoted to paying portion of the expenses of a char-a-banc trip if arranged, which is gratefully acknowledged.

"In general matters the Club has had under consideration the questions of foxes at Phillip Island and the taking of eggs of protected birds. These have been dealt with satisfactorily by the Fisheries and Game Department. It is gratifying to record that the Lands Department has decided that the grazing rights at Mount Buffalo are not to be renewed for 1921, while the bird sanctuary at Lake Hattah (Wimmera) is not to be interfered with.

"The love for our native animals and plants is steadily growing, and, we trust, will be sufficiently strong to prevent the loss of species of either section of our unique animal and vegetable life.

"The annual exhibition of wild-flowers was held, under great disadvantage, in the upper hall of the Melbourne Town Hall on 28th September, when the Acting Governor, Sir Wm. Irvine, K.C.M.G., opened the exhibition, and expressed his great appreciation of the display. A profit of £107 was made, portion of which was added to the Plant Names Publication Fund. The Club was greatly indebted to members of the Microscopical Society for adding to the interest of the exhibition, and to several lady members and friends for the successful management of the refreshment department. To the Director of the Botanical Gardens, Mr. J. Cronin, the Club is greatly indebted, as on many previous occasions, for the fine display of Australian flowers, thereby indicating the possibilities of

Australian plants for garden culture. To those members and friends who, by their generous help in collecting flowers and carrying out minor details, rendered the exhibition possible, your committee would tender its very best thanks.

"The Club has again been unfortunate in some of its executive officers elected at the annual meeting. In July Mr. W. Glance, who had been assistant secretary for five years, was compelled to resign, owing to ill-health; after some interval Mr. C. Oke consented to fill the vacancy. In February Mr. R. W. Armitage, M.Sc., found that his official duties did not allow him sufficient liberty to carry out the duties of hon. secretary, and asked to be relieved of that position. Mr. F. G. A. Barnard kindly added the duties to that of editor until the annual meeting.

"The increased cost of printing the *Naturalist* has been the most important business before the committee during the year, and, notwithstanding that the journal has been curtailed as much as possible, the volume for 1920–21 being 26 pages less than that for 1919–20, the cost has been about £60 more. This great increase in printing charges has greatly exercised the thoughts of your committee, and there seem to be two alternatives which might be adopted (it is to be hoped only temporarily)—viz., further curtailment of the *Naturalist* or an increase in the annual subscription to the Club. This question will require grave consideration by the incoming committee. Meanwhile, your committee desires to acknowledge with many thanks donations amounting to £11 from several members towards the expense of publishing the *Naturalist*.

"The issue of the Club's journal was hampered to some extent by the printers' strike in March and April, 1920, but lost ground was recovered, and, under the editorship of Mr. F. G. A. Barnard, the journal has continued to chronicle the various aspects of natural science in Victoria from month to month.

"The meeting of the Australasian Association for the Advancement of Science, by reason of transit difficulties, was transferred from Hobart to Melbourne; hence many more members of the Club were able to avail themselves of the advantages of the Association gathering than would have been possible had the original programme been carried out.

"The fortieth anniversary of the founding of the Club, which fell upon the May meeting, was made the opportunity for a gathering of the surviving founders and early members, with very pleasing results. Of the eight original members still on the roll seven were present, and, in addition, eleven members of over twenty years' standing were present. Mr. F. G. A. Barnard read an interesting *résumé* of the last fifteen years' history of the

Club, and to Mrs. E. Bage, the only life member, is due the initative of light refreshments and a pleasant half-hour at the close of the meeting. Opportunity was taken at the meeting to present Mr. G. Coghill with a memento of his fifteen years' occupation of the treasurership of the Club, from which he retired in June, 1920.

"Owing to the excessive cost of printing, nothing has resulted from inquiries as to publishing the results of the Plant Names Committee's deliberations. This is greatly to be regretted, as there are numerous nature students in all parts of the State anxiously looking for the promised solver of botanical riddles.

"The balance-sheet to be presented by the hon. treasurer is not so satisfactory as could be wished, owing, as before intimated, to the excessive cost of printing, to which must be also added the increase in postal rates. Little relief is to be expected under either of these headings during the coming year, and your committee would impress upon all members who have the interest of the Club at heart that the best way in which they can express it is by the prompt payment of their annual subscriptions.

"After having had the advantage of the use of Messrs. Coghill and Haughton's office for many years free of cost as a meeting-place for the monthly committee meetings, owing to a change in the caretaking arrangements the committee had to return to the Royal Society's Hall for its meetings, thereby increasing the monthly expenditure.

"Finally, your committee trusts that, though the outlook is at present somewhat gloomy, there is still a good future before the Club, and that when the aftermath of the Great War is finally cleared up it may be possible to record greater progress at a considerably reduced expenditure.

"On behalf of the Committee,
"J. GABRIEL, *President.*
"F. G. A. BARNARD, *Acting Hon. Sec.*

"Melbourne, 25*th May*, 1921."

The reception of the report having been carried, Mr. F. Wisewould congratulated the members on the satisfactory position of the Club, considering the difficulties of the past year; Mr. A. D. Hardy, F.L.S., said that the industrial troubles had greatly hampered the Club in more ways than one; Messrs. Best, Tadgell, Pescott, and Whitmore referred to the great increase in cost of the *Naturalist*, and offered various suggestions; Mr. C. C. Plante urged the committee to take a broader view of the position, and try and induce a larger membership, and thus enable a more suitable place of meeting to be secured, and predicted a great future for the society; Mr. F. E. Wilson

contended that much more favourable prices could be obtained for printing the *Naturalist*, which would allow of its improvement.

The report was adopted, on the motion of Messrs. E. E. Pescott and C. A. Lambert.

FINANCIAL STATEMENT.

The hon. treasurer (Mr. F. Pitcher) presented the financial statement for 1919–20, which was as follows :—

RECEIPTS.

To Balance, 30th April, 1920								£72	8	10
,, Subscriptions—										
Ordinary Members ...	£117	10	0							
Country Members ...	30	0	6							
Associate Members ...	2	5	0							
				£149	15	6*				
,, *Victorian Naturalist*—										
Subscriptions and Sales	6	0	10							
Advertisements ...	2	5	0							
Reprints	1	18	0							
				10	3	10				
,, Sales of Badges				0	6	0				
,, Donations—										
Char-a-banc Excursion Fund... ...				10	0	0				
40th Anniversary Celebrations ...				2	2	0				
Publishing Fund				11	0	0				
,, Interest—Savings Bank and War Loan ...				4	18	3				
,, Discount—Patterson, Shugg's Account ...				0	1	4				
							188	6	11	
To Wild-flower Exhibition—										
Admissions				99	14	0				
Sales of Flowers				23	1	3				
Refreshments				12	6	0				
Donations				1	5	0				
							136	6	3	
							£397	2	0	

*Subscriptions :—Arrears, £19 ; 1920–1, £121 8s. ; advance, £9 7s. 6d.—total £149 15s. 6d.

EXPENDITURE.

By *Victorian Naturalist*—						
Printing (13 months) ...	£154	4	7			
Illustrating	13	4	8			
Free Reprints ...	7	4	0			
Reprints charged ...	1	17	6			
				£176	10	9
,, *Victorian Naturalist*—						
Wrapping and Posting				19	11	10
,, Rooms—Rent and Attendance				13	10	0
,, Library—Periodicals	2	11	6			
Insurance	0	7	0			
				2	18	6
Carried forward ...				£212	11	1

Brought forward	£212 11 1		
By Hire of Lantern	1 10 0		
,, Printing	21 8 7		
,, Postages, &c.	9 13 11		
,, Expenses—40th Anniversary	3 10 0		
,, Purchase of Badges	2 10 0		
		251 3 7	
,, Wild-flower Exhibition—			
Hall and Attendance	9 5 0		
Specimen Glasses	3 10 3		
Expenses	15 17 6		
		28 12 9	
,, Deposit in Savings Bank towards Publication of Plant Names		66 5 10	
,, Hire of Town Hall for June, 1921, Exhibition ...		18 0 0	
		364 2 2	
,, Balance in Savings Bank	30 0 0		
,, ,, London Bank	2 19 10		
		32 19 10	
		£397 2 0	

F. PITCHER, *Hon. Treasurer.*
23*rd May*, 1921.

Audited and found correct.

F. WISEWOULD, A. J. TADGELL, } *Auditors.*

24*th May*, 1921.

The following statement of assets and liabilities was also presented :—

ASSETS.

Balance—Savings Bank and London Bank	£32 19 10
War Loan Bond	20 0 0
Arrears of Subscriptions (£80), say...	40 0 0
Badges on hand	2 15 3
Library and Furniture (Insurance Value)	150 0 0
Deposit in Savings Bank for Plant Names Publication ...	150 0 0
	£395 15 1

LIABILITIES.

Subscriptions paid in advance	£9 7 6
Donation to Char-a-banc Excursion Fund	10 0 0
Deposit for Plant Names Publication	150 0 0
	£169 7 6

On the motion of Messrs. E. E. Pescott, F.L.S., and P. R. H. St. John, the statement was received and adopted.

ELECTION OF OFFICE-BEARERS, 1921–22.

On a ballot being taken for the position of president, Mr. F. Chapman, A.L.S., was duly elected; for two vice-presidents, Messrs. C. Daley, B.A., and E. E. Pescott, F.L.S., were elected. The following office-bearers, being the only nominations, were declared duly elected:—Hon. treasurer, Mr. F. Pitcher; hon. librarian, Mr. P. R. H. St. John; hon. editor, Mr. F. G. A. Barnard; hon. secretary, Mr. C. Oke; for hon. assistant secretary and librarian there was no nomination.

On a ballot being taken for five members of committee, Messrs. C. L. Barrett, C.M.Z.S., J. Gabriel, J. A. Kershaw, F.E.S., C. S. Sutton, M.B., and J. Searle were duly elected.

PAPER.

By Mr. J. W. Audas, F.L.S., entitled "Description of a New Trymalium (N.O. Rhamnaceæ)."

Owing to the lateness of the hour the paper was taken as read. The author described as *Trymalium ramosissimum*, on account of its branching habit, a small rhamnaceous shrub found in the Mount Difficult Range (Grampians) by Mr. C. W. D'Alton and himself, the new species being closely allied to *T. D'Altoni*, F. v. M.

NATURAL HISTORY NOTES.

Mr. E. E. Keep mentioned that one morning recently he noticed several blackbirds heckling a Butcher-bird which had some object in its bill. The bird happening to fly nearer to him, he was enabled to identify a Goldfinch as the object which was exciting the blackbirds' pity.

Mr. C. Oke stated that, among the objects he had taken on the recent excursion to Ferntree Gully was a specimen of Peripatus.

EXHIBITS.

The list of exhibitors and their exhibits is unfortunately crowded out of this issue, and will appear next month.

NATURE LOVERS' EXHIBITION.

A report of this exhibition, held on 14th June, will appear in the next issue.

After the usual conversazione the meeting terminated.

Vol. XXXVIII.—No. 4. August, 1921.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

Published 4th August, 1921.

Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	25
Nature Study Exhibition	28
Some Observations on Mantids. By B. Blackbourn ..	30
Description of a New Trymalium (N.O. Rhamnaceæ), Trymalium ramosissimum, nov. sp. By J. H. Audas, F.L.S., F.R.M.S., National Herbarium, Melbourne ..	34
Notes	33, 35
Obituary	36

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1921.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 8th AUGUST, 1921.

SPECIAL MEETING TO CONSIDER ALTERATIONS TO RULES.

At 8 p.m.

BUSINESS:

1. Mr. A. D. Hardy, A.L.S., to move that the word "fourteen" be substituted for "sixteen" in Rule 4, clause *d*.
2. Mr. F. Keep to move that the words "The immediate Past President to be an *ex officio* member of the oommittee" be added to Rule 12.

ORDINARY BUSINESS:

1. Correspondence and Reports.
2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Miss Ethel Bage, M.A., Fulton Street, East St. Kilda.	Mr. A. D. Hardy, F.L.S.	Mr. F. G. A. Barnard.
Miss Marjorie Boyd, 100 Grey Street, East Melbourne.	Mr. C. Oke.	Mr. F. Chapman, A.L.S.
Miss C. G. Whiting, 163 Glen Eira Road, East St. Kilda.	Mr. J. W. Audas.	Mr. H. B. Williamson.
Mr. G. P. Onyons, 24 Malakoff Street, Malvern.	Mr. C. Oke.	Mr. F. Chapman, A.L.S.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

   Election of Assistant Hon. Secretary and Librarian.—Nominee: Mr. H. B. Williamson.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for examination of Exhibits.

6. Reading of Papers and Discussion thereon.

   1. By Mr. T. S. Hart, M.A.—"The Gippsland Lakes Country—The Physiographical Features."
   2. By Mr. C. Oke.—"A Day's Beetle Hunting at the Lerderderg."

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

The Victorian Naturalist.

Vol. XXXVIII.—No. 4. AUGUST 4, 1921. No. 452.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 11th July, 1921.

The president, Mr. F. Chapman, A.L.S., occupied the chair, and about sixty members and visitors were present.

REPORT.

A report of the visit to the National Museum (Palæontological Department) on Saturday, 18th June, was given by the leader, Mr. F. Chapman, A.L.S., who said that the party included several members of the Microscopical Society. The afternoon had been devoted to fossil vertebrates, and an instructive and interesting afternoon had been spent.

ELECTION OF MEMBERS.

On a ballot being taken, Miss N. Thresher, Black-street, Middle Brighton: Miss T. V. Healy, Southey-street, Sandringham; Mrs. M. Thompson, 26 Fawkner-street, St. Kilda; Mr. G. H. Shugg, Pensions Office, Elizabeth-street, Melbourne; and Mr. J. M. Wilson, 57 Swanston-street, Melbourne, were duly elected members of the Club.

GENERAL BUSINESS.

The chairman stated that since last meeting two members of the Club had passed away—Mr. E. H. Lees, C.E., of Mallacoota, and Mr. J. P. M'Lennan, of the School of Horticulture, Burnley. Each had been a useful member of the Club, and their loss would be keenly felt. Brief references to the deceased members were made by Messrs. Hardy, Daley, Barnard, and Hammet, and on the motion of Messrs. Barnard and Daley letters of sympathy were directed to be sent to the relatives. The motion was carried in silence, members standing.

Mr. F. Keep said that an important item had been forgotten at the previous meeting of the Club—viz., the proposal of a vote of thanks to the retiring office-bearers. He considered that great credit was due to the committee of management for the success of the Club, and moved accordingly. This was seconded by Mr. H. B. Williamson and carried unanimously. In the absence of Mr. J. Gabriel, the past president, the vote was briefly acknowledged by the chairman.

In pursuance of notice of motion, Mr. F. Keep moved that steps be taken to alter the rules of the Club so as to provide

that a retiring president becomes *ex officio* a member of the committee for the following year. After some discussion the matter was referred to the committee, with a request to take the necessary steps to embody the proposal in the rules of the Club.

Mr. A. D. Hardy, F.L.S., drew attention to the Club rule fixing the age of associate members at 16 years and upwards. He thought that, since the abolition of junior members, the age of associates might be lowered to fourteen, and moved that the committee take this alteration into consideration when arranging for a special meeting to alter the rules.

NOMINATION FOR ASSISTANT HON. SECRETARY.

Mr. P. R. H. St. John said that Mr. H. B. Williamson had consented to allow himself to be nominated for the vacancy in the office-bearers—viz., honorary assistant secretary and librarian—and nominated him accordingly. Seconded by Mr. C. Daley, B.A.

PAPER READ.

By Mr. F. E. Wilson, entitled "An Entomologist in Southern Queensland."

The author gave an interesting account of a recent visit to Southern Queensland, mainly with the view of adding to his entomological collection, in which he was very successful; nearly two hundred species of beetles had been taken, of which three were new to science. His remarks were not confined entirely to entomology, botany and ornithology receiving some attention. He mentioned that on cutting open some oranges obtained from an orchard they were discovered to be simply alive with the larvæ of the Queensland fruit-fly.

Messrs. C. L. Barrett, C.M.Z.S., and C. Oke congratulated the author on the interesting character of his paper and the excellent work he is doing amongst coleoptera.

EXHIBITS.

By Mr. F. Chapman, A.L.S.—Coralloid and other structures in magnesian limestone from Sunderland, England, photographed by Dr. W. J. Abbott, of Tunbridge Wells; flowering sprays of Sallow Wattle, *Acacia longifolia*, from a tree about three years old.

By Mr. F. Cudmore.—Large fossil oyster shells from the Janjukian beds at Boggy Creek, near Bairnsdale.

By Mr. C. Daley, F.L.S.—Seed-vessel of *Lambertia formosa* (N.O. Proteaceæ), Honey-flower of New South Wales. From their formidable appearance the seed-vessels are known as "mountain devils"; upper and lower jaws and scale of Queensland Lung-fish, *Ceratodus forsteri*.

By Mr. C. J. Gabriel.—Marine shells from Philippine Islands —*Pterocera aurantia*, Lam., *P. multipes*, Deth., and *Strombus lacimatus*, Chem.

By Mr. C. Oke.—Coleoptera collected on Macedon excursion.

By Mr. J. Searle (under microscope).—Section of head of embryo chick, showing pineal eye; larva of crayfish; Phantom Shrimp, Lucifer, sp.; and Coprella, sp.

After the usual conversazione the meeting terminated.

The following exhibits made at the June meeting were crowded out of the last *Naturalist*:—

By Mr. F. Chapman, A.L.S.—Section of Buloke, *Casuarina Luehmanni*, R. T. B., showing many points of structure.

By Mr. C. French, jun.—Orchid in flower, *Pterostylis præcox*, from Ashburton.

By Miss A. Fuller.—*Bryophyllum crenatum* growing from edges of leaves, from Nauru.

By Rev. A. J. Maher.—Photographic studies of trees.

By Mr. A. J. Tadgell.—Spear-fruited Salt-bush, *Bassia quinquecuspis*, F. v. M., var. *villosa*, from Sunbury—a stiff, bushy shrub, originally recorded from North-West Victoria, now spreading easterly; Narrow-leaved Podotheca, *P. angustifolia*, winter and summer forms; ferruginous clay from Bolinda Creek, near Lancefield Junction, suitable for use as a pigment.

By Mr. H. Whitmore.—Section of stem of Common Elm, *Ulmus campestris*, showing the branches originating from the heart-wood.

By Mr. H. B. Williamson.—Orchid, *Corysanthes bicalcarata*, Fitz., "Spurred Helmet Orchid," new for Victoria, collected at Healesville, 7th June, 1921, by the Misses D. and G. Coleman; also wild-flowers from exhibition on 14th June, collected by Mr. F. Wisewould, Pakenham, Mr. T. S. Hart, M.A., Bairnsdale, Mr. D. Paton, Bendigo, Mr. C. D'Alton, Hall's Gap, and the pupils of Dimboola, Ouyen, and Pakenham State schools; also from South Australian contributors—Miss Zoe Amos, Upper Sturt, Mrs. L. E. Page, Myponga, and head teachers of public schools at Kangarilla and Victor Harbour, per the Field Naturalists' section of the Royal Society of South Australia, Adelaide.

CORRECTIONS.—In exhibits by Mr. J. R. Tovey, in *Naturalist* for May, 1921, page 10, for "Centaurea" read "Erythræa."

In July *Naturalist*, page 17, line 2 of report, date should read "4th June."

NATURE STUDY EXHIBITION.

PARTLY in response to an expressed idea that an exhibition of natural history specimens would prove an interesting attraction to the general public, and partly to augment the funds of the Field Naturalists' Club and of the Microscopical Society—considerably depleted by the high cost of printing—a combined exhibition by the members of the two societies was held in the Melbourne Town Hall on Tuesday, 14th June. As anticipated, it was well attended, and it was gratifying to see that several schools took advantage of the opportunity to demonstrate some of Nature's handiwork to their senior pupils, the pupils of one school being brought by private conveyance from a distance of over ten miles.

Mr. F. Chapman, A.L.S., president of the Microscopical Society and one of the vice-presidents of the Field Naturalists' Club, in welcoming His Excellency the State Governor, Lord Stradbroke, to the exhibition, gave a brief outline of the activities of the two societies. In declaring the exhibition open Lord Stradbroke said he was delighted to find so much encouragement being given to the people of Victoria to study Nature in all her aspects. Such an exhibition as this should help young people to take a pride in their country and its natural productions. He had not had many opportunities yet of becoming acquainted with the varied features of Victoria, but he doubted if he would become tired of the many varieties of gum-trees, as had been suggested to him. Later, His Excellency devoted considerable time to an examination of the exhibits, and mentioned that it was a great disappointment to Lady Stradbroke that she had not sufficiently recovered from her illness to be able to be present, for she was always greatly interested in exhibitions of the kind.

It is impossible in the amount of space at our disposal to do more than briefly list the exhibits of the different exhibitors. The exhibits of a similar nature were grouped together, and some very effective displays were made.

Botany.—Though not the wild-flower season, a fair display of native flowers was made through the organization of Mr. H. B. Williamson. Flowers were received from Western Australia and South Australia and from many parts of Victoria, the exhibitors being Miss C. Currie, Miss G. Nokes, Messrs. T. C. Bryan, G. Coghill, C. D'Alton, N. W. Gay, A. D. Hardy, T. S. Hart, D. Paton, A. Tadgell, — Thornhill, Rev. W. C. Tippett, A. Vroland, and F. Wisewould; the Creswick Forest School, Macedon State Nursery, and the Linton, Maldon, Ouyen, and Pakenham State schools. Mr. C. C. Brittlebank, 3 drawers of fungus pests.

Conchology.—Mr. C. J. Gabriel, ten drawers of foreign and Australian marine shells (a very fine display); also an exhibit showing method of working of the destructive ship-borer, Teredo.

Entomology.—Mr. D. Best, two drawers of beetles (Carabidæ); Mr. J. E. Dixon, two drawers of Coleoptera: Mr. C. French, ten drawers life-histories of insects, &c.; Miss Fuller, gall insects from Western Australia; Mr. J. Kershaw, four drawers of Lepidoptera; Mr. C. Oke, two cases Coleoptera; Mr. F. Spry, three drawers of ants; Mr. L. Thorn, ten drawers of Lepidoptera; Mr. F. E. Wilson, two drawers of beetles (Tenebrionidæ); National Museum, case of trap-door spiders.

Ethnology.—Mr. E. Anthony, case of native weapons, &c.; Mr. C. Daley, case of aboriginal stone implements; Mr. T. C. Bryan, implements.

Forestry.—Mr. A. D. Hardy, F.L.S., on behalf of the Forest Department, comprehensive exhibit of forest products—timbers (dressed and undressed), honey, oils, kinos, foliage, &c.; photographs in illustration of forestry, both natural and artificial conditions.

Geology and Palæontology.—Mr. T. C. Bryan, fossil conglomerate; Mr. F. Cudmore, a large collection of fossil sharks' teeth and mollusca, illustrating and comparing the Tertiary formations of Australia and England; Miss C. Currie, matrix of turquoise, and gold in quartz, from Corryong; Mr. F. Chapman, A.L.S., Middle Cambrian fossils from British Columbia; Mr. C. Daley, B.A., collection of Australian minerals; Mr. T. S. Hart, M.A., natural lodestone from Nowa Nowa, Victoria; Mr. J. R. Mitchell, case of Australian minerals; Mr. W. Scott, flexible sandstone from India.

Ornithology.—Director National Museum, specimens of the larger birds of Victoria; Royal Australasian Ornithologists' Union, three drawers of Australian bird-skins, coloured plates from Gould's "Birds of Australia"; Mr. H. Syme, a white form of the Grey Goshawk.

Zoology.—Director of National Museum, representative collection of Australian animals, also reptiles in spirits; Miss C. C. Currie, mammals in spirits; Mr. H. W. Davey, F.E.S., live specimens of Japanese newts; Mr. D. Le Souëf, C.M.Z.S., live carpet snake and live stump-tailed lizard; Mr. C. Oke, lizards and snakes.

The Microscopical Society was well represented by members with microscopes, who made a very fine display of objects of interest. These were a great source of attraction throughout the afternoon and evening.

SOME OBSERVATIONS ON MANTIDS.

WITH SPECIAL REFERENCE TO THE REPRODUCTION OF LOST LIMBS.

BY B. BLACKBOURN.

(Communicated by C. French, jun.)

(*Read before the Field Naturalists' Club of Victoria, 11th April*, 1921.)

IN the classification of insects the mantids form a very definite family of the order Orthoptera (straight-winged insects). A main difference of the insects of this order from those of the other orders is that the individuals, on emergence from the egg, resemble the perfect insect in most respects but size, and that they continue to grow until reaching the adult size.

My remarks refer principally to the common Green Mantis, *Orthodera ministralis*, Fab., to be found in most gardens about Melbourne.

It will perhaps be best if I simply describe the growth of a few which I have kept in captivity. On 6th November I found two young mantids, bright green in colour, with a dark stripe down the back, and about three-eighths of an inch in length, on some bean plants. A third was found, of about the same size, a few days later, though, as the other two had grown considerably meanwhile, I was able to distinguish them apart. At first I was at a loss to know how I could keep them for purposes of observation, but eventually obtained an empty glass potted-meat jar, into which I put some water and a few sprigs plucked from a climbing rose, and placed it on a sheet of white paper under a large glass clock-cover.

As most of my readers will know, the mantids are carnivorous insects, their habit being to lie in wait amongst vegetation and capture flying insects of various sorts that come within reach by means of their first pair of legs, which are modified into terrible weapons of offence—studded on their inside edges with rows of sharp spines, and shutting up while at rest on the same principle as a razor blade. They can fast for a considerable time, and in a state of nature probably go for long periods without food of any kind.

My first problem was how to find food suitable for creatures of such small size, as it is necessary that it should be in a living state. On the beans they doubtless fed on minute flies, but these were practically impossible to catch without damaging them. I at last hit upon a plan which proved remarkably successful. A jar full of pond life, well stocked with mosquito larvæ, provided me with a regular supply of fresh meat for my captives. As soon as the larvæ attained the pupa state I placed them in some water in a doll's mug. This I put under the glass cover, and in a short time the mosquitoes hatched,

and were soon supplying the young mantids with plenty of amusement, if not with an altogether satisfying meal. As the mosquitoes flew about, trailing their long legs, the tiny Mantids would strike at them as they passed, and in the early stages seldom caught the whole mosquito, but, instead, one or two of the legs. These they would consume with much gusto, commencing at one end and eating them in exactly the same way as some people eat celery. Most of the mosquitoes were reduced in a short time to one or two legs apiece. As the mantids grew in size they were able to catch the whole mosquito, and these formed their main food until they were large enough to tackle small house flies.

On 15th November No. 1 cast his old skin, and was followed by No. 2 and No. 3 on 23rd and 26th November. On 2nd December No. 1 again changed his skin, but lost one of the second pair of legs in the process. This did not appear to cause him any very serious inconvenience, and was useful in enabling me to distinguish between No. 1 and No. 2, which were exactly alike in size and appearance. On 23rd December No. 1 again changed his skin, and, to my surprise, the missing leg was replaced by one a size smaller than its fellow on the opposite side. I was aware that newts and crabs could replace lost limbs, and lizards lost tails; but that insects could replace lost limbs was new to me. What I cannot quite understand is where the new limb was developed. There was no sign of it until the old skin was cast off, and then the new limb appeared complete. However, I was to see more of this before long.

On Christmas Day No. 3 cast his skin for the third time, and in so doing had a serious accident. A day or two before this change of skin a mantis refuses food, and frequently becomes very restless if confined. Its one idea seems to be to get as high up as possible. Once there it attaches itself firmly to the under side of a leaf, the skin splits at the back of the thorax, and the creature gradually emerges hanging head downwards. As the operation proceeds the legs are freed one by one until at last it is left hanging only by the tip of its abdomen. Just as the observer expects it to slip out and fall to the ground the insect makes one tremendous effort, raises itself up, takes firm hold with its legs, and shakes the old skin off its abdomen. It cannot always rid itself of the skin in one effort, but with intervals of rest it tries repeatedly until it is freed. At this time it is in an extremely soft state, and easily injured. It appeared to me that No. 3 must have fallen during the operation. I was away at the time, but on my return I found it on the table, apparently dead. It revived, however, but was badly crippled. One of the clasping fore legs was twisted in such a way as not only to be useless, but to constantly become

entangled with its other legs when it attempted to walk. One of the back legs also was twisted, so as to get in the way of its fellow on the other side. A short time afterwards it fell into the water in the jar, and was fished out apparently drowned, but recovered. It was clear that in such a crippled condition it could not catch its prey, and, bearing in mind the replacement of the limb in No. 1, I amputated part of the fore leg, removing the femur, tibia, and tarsus, and also the tibia and tarsus of the hind leg. So little was the insect affected by this that a couple of minutes after it was cleaning its remaining fore leg with its mandibles as if nothing had happened. To make a long story short, on 8th January it changed its skin again. There appeared a slight lengthening of the hind leg, but I could not distinguish any difference in the fore leg. On 24th January another change took place, and this time a complete though small edition of the fore leg appeared, and the hind leg was larger, though still not quite perfectly developed. I hoped to be able to watch its growth until the adult stage was reached, but, being on the point of leaving for England, I was obliged to transfer this mantis, as well as No. 1, to a small jam jar. The change, unfortunately, proved disastrous to No. 1. In what I believe to be its final moult, it was badly crippled through becoming entangled in some twigs, owing, no doubt, to insufficient room in the jar.

I was afraid that, with only one clasping leg, mantis No. 3 might not be able to catch and hold its prey, but my mind was soon set at rest on that score. On one occasion it struck at a fly, but only caught it by the tip of one wing. Having only the one fore leg, it could not pin the fly down. What it did was to take the tip of the wing in its mouth and hold tight to that, while it let go with its leg and took a fresh hold round the fly's body. That action showed something remarkably like reasoning power.

In the early stages one house fly every other day appeared to be as much food as was necessary, though when nearing maturity they can manage several at a meal. I once had a full-grown specimen which, on first being found, ate six flies and a "blue-bottle" at one sitting, offered to it with a pair of forceps. When my mantids were really hungry it was amusing to watch the way they followed with their eyes a fly introduced into the cage, and they would hasten to take up fresh positions which offered a better chance of capture. On other occasions I have known them stalk an insect at a pace which was scarcely perceptible.

I once kept a mantis for some months in New South Wales which became quite tame. At the time of capture it was one and a half inches long, and it grew to be over five. One night

I placed a sleepy fly on the curtain, about three inches in front of its face. It took just half an hour to cover that distance. It would disengage one foot, bring it forward so slowly that the movement was hardly distinguishable, gently feel for a fresh foothold, and then repeat the process with another leg. The fly, which had been cleaning its wings, eyes, &c., quite unconscious of the approaching enemy, at the last moment turned to fly away, but too late—in a flash the mantis had her in its grasp.

It is curious that flies do not appear to perceive mantids. I have repeatedly seen them settle on one and run along its back or leg. If the mantis is not hungry it takes no notice; but if its appetite is keen it twists round like lightning and grasps the fly, whose fate is for ever sealed. Their bodies are remarkably flexible, and, though they will keep absolutely still for hours, their movements are at times so rapid as to be almost unperceivable. Often, when a mantis catches sight of possible prey, it commences a swaying motion from side to side, and keeps this up while stalking. The prey never appears to take notice, no doubt mistaking the mantis for a twig swayed by the wind.

I was surprised to find that mantids have a considerable power of jumping, though I do not think they exercise it in obtaining food, but only in escaping from enemies. The jump is not forward, but appears to be a kind of back somersault. One night, when a mantis was in a very excitable and restless mood, due to the near approach of the skin-casting business, there were three large and lively flies in the jar, one of which ran under its "nose," and the mantis jumped right across from one side of the jar to the other.

Mantids probably grow faster when in captivity, owing to regular and abundant food, but in a natural state they can go for long periods without food. This fact makes them excellent pets, as one need not worry if there is a difficulty in obtaining supplies for several days owing to change of weather or other reason.

NEW BRITISH MICROSCOPES.—The *Scientific Australian* for June contains an interesting description by Mr. W. M. Bale, F.R.M.S., of new standard types of microscopes which are being manufactured by British makers in order to meet the specification of the British Science Guild. There are three types—the cheapest, for students, to supersede the German instrument hitherto in use; a better type for pathological, work; and a high-class instrument for research work. Examples of the types can be inspected at Messrs. Watson and Sons', Swanston-street, Melbourne.

DESCRIPTION OF A NEW TRYMALIUM (N.O. RHAMNACEÆ), *TRYMALIUM RAMOSISSIMUM*, nov. sp.

By J. W. AUDAS, F.L.S., F.R.M.S., National Herbarium, Melbourne.

(*Read before the Field Naturalists' Club of Victoria, 20th June*, 1921.)

THE new Trymalium which I was fortunate in discovering at the Grampians, Victoria, in October, 1919, belongs to a very large order—the Rhamnaceæ—which occurs over a considerable area of the tropical and temperate zones in both hemispheres, Australia possessing about a dozen genera, some being much more widely dispersed than others, while a few are almost endemic.

The order is strongly marked and readily separated from all others, the only one bearing any similarity being Vitaceæ. It is a difficult order to characterize; the genera often merge into each other by the very finest gradations—so much, indeed, is the resemblance in flowers and foliage between Trymalium, Spyridium, and Stenanthemum that the late Baron von Mueller, in his "Census of Australian Plants," grouped them all under the genus Cryptandra. We find, however, that in Bentham's work, "Flora Australiensis," these genera are kept distinct, and botanists now recognize this classification.

This new Trymalium, which I have specifically named *T. ramosissimum*, on account of its branching habit, is closely allied to *T. Daltoni*. The latter was discovered at the Grampians about forty-five years ago by Mr. St. Eloy D'Alton, the well-known collector, and was named after him by Baron von Mueller.

In order to place before you the distinctions of this new species, I will compare it with its relative, *T. Daltoni*. On examining the leaves, those of *T. Daltoni* are long, sharp-pointed, with a deep centre furrow, and smooth, dark green surface, recurving so much as to almost hide the back of leaf, while those of *T. ramosissimum* are obtuse, ovate-lanceolate, only slightly curving at the edges, with a thick, prominent, raised line along the centre underneath. They are of a grey-green colour, and the flat surface shows distinct veining. When comparing the flowers the most striking feature is in the calyx, that of *T. Daltoni* being about the same length as the petals; but in *T. ramosissimum* the calyx exceeds the petals in length, and is much more woolly. The stipules also present differences. Those of the newer species are straight and have a broad, clasping base, while those of *T. Daltoni* are uniformly narrow, grading to a point, and somewhat curved. The bracts of *T. ramosissimum* are few, ovate; those of *T. Daltoni* are numerous,

PLATE I.

TRYMALIUM RAMOSISSIMUM, AUDAS, sp. nov.

A. Leafy and flowering branch. B. Under surface of leaf. C. Upper surface of leaf. D. Section of leaf. E. Bracts. F. Flower. D., E., and F. magnified.

lanceolate. In vestiture *T. Daltoni* is dark and somewhat coarse, having shorter appressed hairs. *T. ramosissimum* is much lighter, and has long silky hairs.

For general purposes I describe this new species as follows :—

TRYMALIUM RAMOSISSIMUM, sp. nov.

A small shrub 40–60 cm. (about 1½ to 2 feet) high, with spreading branches covered with a woolly tomentum ; leaves flat, ovate-lanceolate, 10–15 mm. long, 3 to 5 mm. broad, glabrous, with distinct venation, greyish-green colour above, slightly recurved, the under surface hoary or white, with a very prominent midrib; flower-heads crowded; bracts brown, ovate, acute ; calyx 3 mm. long, woolly, exceeding the petals; disk conspicuous ; stipules channelled, straight, clasping.

Hab.—Victoria—Grampians (Mount Difficult), C. W. D'Alton and J. W. Audas.

TASMANIAN FIELD NATURALISTS' CLUB.—This society has again shown evidence of its activity by carrying out a well-planned Easter camp at Adventure Bay, South Bruny Island. In all, forty-one members and friends went into camp, the seventeenth organized by the Club. Previous to the war the parties were much larger, as many as one hundred visiting Wineglass Bay in 1914. The published report of the camp-out provides very interesting reading, and records quite a lot of useful work done in almost every branch of natural history. The report is nicely illustrated, and depicts some very fine rock scenery.

A FROG IN A PINE TREE.—The *Sunraysia Daily* (Mildura) of 11th June contains an account of the finding of a frog in the heart of a pine tree, Callitris, sp., when being felled at Red Cliffs, near Mildura. The tree had a stem diameter of about a foot, and was apparently quite solid, the Murray Pine being noted for its freedom from defects. The woodcutter was greatly surprised to find a hollow in the wood, and further surprised when a large green frog hopped out of it. Close examination of the tree failed to detect any entrance to the hollow, hence the questions arise, How did the frog get there ? and how long had it been there ? There were at least four inches of solid wood between the hollow and the outside of the tree, the hollow being ten inches long, with solid wood above and below. Unfortunately, the frog got away, and it is therefore impossible to say to what species it belonged, or to theorize as to its age.

OBITUARY.

THE LATE EDWARD H. LEES, C.E., F.R.A.S.—By the death of Mr. E. H. Lees on 30th June last Eastern Gippsland has lost one who was always ready and willing to point out its features and characteristics to strangers. Engaged for some years on geodetic survey work in northern South Australia, he there became acquainted with the native tribes and their customs, and in his only paper to the Club, "What is Nardoo?" (*Vict. Nat.*, vol. xxxi., p. 133, January, 1915), knowledge which he gained at that time is placed on record. His statements drew a rejoinder from Prof. Sir W. Baldwin Spencer, F.R.S., in a paper with the same title (*Vict. Nat.*, vol. xxxv., p. 8, May, 1918). Since 1890 Mr. Lees had been Government contract surveyor for Croajingolong, and resided at Mallacoota. His duties as selection and road surveyor took him into much new country, and, being of an observant nature, he thus gained an extensive knowledge of the plants and animals of the district. His membership of the Club dated from May, 1903.

THE LATE JOHN P. M'LENNAN.—After completing his course of training as a school teacher, Mr. M'Lennan occupied positions in various parts of Victoria. When in charge of Emerald school, in 1900, he became acquainted with the late Mr. H. T. Tisdall, who, as a school teacher, had been induced to take up botany as a study by the late Baron von Mueller. Mr. Tisdall's enthusiasm caught on, and Mr. M'Lennan became a student of the flora of the Emerald district. Becoming a member of the Club in June, 1904, he forwarded many parcels of flowers to the Club's exhibitions from that district. His interest in plant life led to his appointment as Supervisor of Agriculture in State Schools, and he thus had opportunities of becoming acquainted with the botany of the whole of Victoria. In 1911 he became head-master of the Agricultural High School at Warragul, from which he was transferred in 1916 to the position of superintendent of the School of Horticulture at Burnley Gardens. He served as a member of the Plant Names Committee for several years, and on two ocasions conducted excursions of the Club to the gardens. His genial nature made him a general favourite in many connections, such as the Australian Natives' Association, the Freemasons, &c. He was, unfortunately, the victim of a serious boating accident towards the end of last year, when he almost lost his life, from the shock of which he never recovered, passing away on 6th July, after a long illness.

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The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

Published 8th September, 1921.

Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	37
Notes on the Migratory Locust and the Invasion of 1886. By James Hill	40
Book Notice	43
Note	44

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1921.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 12th SEPTEMBER, 1921.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Mrs. L. Hodgson,	Mr. F. Keep.	Mr. A. E. Keep.
Mr. L. Hodgson, "Myrniong," Grange Avenue, Canterbury.	Mr. F. Keep,	Mr. A. E. Keep.
As Country Member—		
Miss R. Currie, P.O., Lardner.	Mr. C. Oke.	Mr. F. Chapman, A.L.S.
As Associate Member—		
Miss Margaret Swinburne, Kinkora Road, Hawthorn.	Miss A. Fuller.	Miss G. Nethercote.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for examination of Exhibits.

6. Reading of Papers and Discussion thereon.

   By Mr. Owen Jones.—"Forestry." Illustrated by lantern slides.

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICE.

Subscriptions for 1921–22 are now due. Early payment will be greatly appreciated by the Hon. Treasurer and Committee.

Any change of address should be notified to the Hon. Secretary at once.

The Victorian Naturalist.

Vol. XXXVIII.—No. 5. SEPTEMBER 8, 1921. No. 453.

FIELD NATURALISTS' CLUB OF VICTORIA.

A SPECIAL meeting of the Club to consider certain proposed alterations in the Rules was held at the Royal Society's Hall on Monday evening, 8th August, 1921.

The president, Mr. F. Chapman, A.L.S., occupied the chair, and about fifty members were present.

Re minimum age of junior members.—Moved by Mr. F. G. A. Barnard and seconded by Mr. C. Daley—"That in clause *d* of Rule 4 the word 'fourteen' be substituted for the word 'sixteen.'"—Carried.

Re addition to Rule 12.—Moved by Mr. F. Keep and seconded by Mr. J. L. Robertson—"That the words 'the immediate past president to be an *ex officio* member of the committee.'"—Carried.

ORDINARY MONTHLY MEETING.

REPORTS.

A report of the excursion to West Essendon on Saturday, 14th May, was forwarded by the leader, Mr. R. W. Armitage, B.Sc., who reported an interesting afternoon. Though the sand-pits are worked out, enough remains to indicate the geological characters of the occurrence, which was fully described, with an illustration, in the *Naturalist* for July, 1910 (xxvii., p. 48). Near an outcrop of quartz, &c., not far away a number of chippings of aboriginal stone implements were obtained.

A report of the visit to the Geological Museum on Saturday, 16th July, was made by Mr. C. Daley, F.L.S., who said that a party of members had been shown over the museum by Mr. R. Keble, who explained a number of the more interesting specimens and indicated the economic uses of many of them.

A report of the excursion from Greensborough to Eltham on Saturday, 6th August, was given by Mr. A. L. Scott, who said that, though the afternoon was cold and dull, the outing had been enjoyed. The wattles were rather backward, except near the river at Eltham, where some blooms were obtained for home decoration. Several curious growths of galls were detected on some eucalypts, and specimens obtained for further investigation.

ELECTION OF MEMBERS.

On a ballot being taken, Miss E. Bage, Fulton-street, East St. Kilda: Miss M. Boyd, 100 Grey-street, East Melbourne: Mrs. C. G. Whiting, 163 Glen Eira-road, East St. Kilda; and Mr. G. F. Onyons, 24 Malakoff-street, Malvern, were duly elected ordinary members of the Club.

HON. ASSISTANT SECRETARY.

There being no other nomination, Mr. B. Williamson, Waverley-road, Caulfield, was declared elected to the position.

REMARKS ON EXHIBITS.

Mr. C. J. Gabriel called attention to his exhibit of three species of Victorian marine shells belonging to the family Gastrochænidæ, known as "Tube Shells." In this group the animals live enclosed in tubes or burrows, which they never leave, and which are frequently embedded in mud or stone, the shells or valves being either free or embedded. At first sight it might be considered that these peculiar shells should be placed among the univalves, but a closer examination will show that they are true bivalves. In the genus Brechites both valves are embedded in the walls of the lower end of the shelly tubes. In the genus Clavagella one valve is embedded in the tube, while the opposite valve is always free. In the genus Gastrochæna both valves are free in the thickened end of the calcareous tube.

PAPERS READ.

1. By Mr. T. S. Hart, M.A., entitled "The Gippsland Lakes Country: The Physiographical Features."

In the absence of the author, the paper was read by the president, Mr. F. Chapman, A.L.S.

The author said that the late Dr. Hall's paper on the Gippsland Lakes, read before the Club, left some points untouched, which he had been able, during a residence of several years at Bairnsdale, to work out to some extent. There had been great denudation of the land to the north of the Lakes, and in certain places a considerable uplifting had taken place.

The paper was well illustrated by maps and photographs. Some of the latter, having been taken from an aeroplane, were of a unique character, depicting the remarkable silt-jetties of the Mitchell River at its entrance to Lake King in a very realistic way. The Lakes' Entrance and its surroundings was easily understood from its aerial picture.

The paper led to some discussion, in which Messrs. C. Daley, B.A., H. B. Williamson, and A. E. Keep joined.

2. By Mr. C. Oke, entitled "A Day's Beetle-Hunting at the Lerderderg."

The author gave an interesting account of a hunt under the stones at the Lerderderg Gorge for the minute beetles which frequent ants' nests, and exhibited a number of species in illustration of his remarks, some being shown as microscopic objects in order that their very peculiar structure might be more easily seen. The reason for this association of ants and beetles is still far from clear, and the author was unable to give a definite opinion on the subject.

The author was congratulated by Messrs. Barnard, Daley, Wilson, Barrett, and Davey on having taken up a subject which required so much patience and careful search, and the hope was expressed that his investigations would lead to the unravelling of the singular association of the two dissimilar groups of insects. A large number of specimens were exhibited in illustration of his remarks.

EXHIBITS.

By Mr. J. W. Audas, F.L.S.—Specimens of *Euryops abrotanifolius*, D. C., "Southernwood-leaf Europus" (Compositæ), a native of South Africa, which has become a garden escape at Menzies Creek and Paradise (Dandenong Ranges); collected by exhibitor, 6th August, 1921.

By Mr. F. Cudmore.—Specimen of the fossil volute shell, *Voluta macroptera*, M'Coy, from the Janjukian beds of Torquay, near Geelong.

By Mr. H. W. Davey, F.E.S.—Japanese newts (alive).

By Mr. C. J. Gabriel.—Victorian marine shells—*Gastrochæna Tasmanica*, T. Wds., *Clavagella australis*, Srby., *C. multangularis*, Tate, and *Humphreyia Strangei*, A. Ad.

By Mr. T. Green.—Stereo.-photographs of orchids recently collected by Mr. A. J. Tadgell, including a twin flower-spike of *Pterostylis concinna*.

By Mr. T. S. Hart, M.A.—Maps and photographs of the Bairnsdale area, in illustration of paper.

By Miss G. Nokes.—Orchid, *Corysanthes pruinosa*, twin flower, a rare form, from Sandringham.

By Mr. C. Oke.—Coleoptera from the Lerderderg, including Psclaphus, sp., *Aritecras curvicornis*, West., and *Chlamydopsis ectatomonæ*, Lea, under the microscope.

By Mr. P. R. H. St. John, on behalf of Mr. Justice Mann.—A singular fungus, found at Oakleigh.

By Mr. A. J. Tadgell.—Fresh flowers of forty species of indigenous plants, including seven wattles (acacias), *Leptospermum lævigatum*, five orchids, and *Hovea heterophylla*, &c.

By Mr. J. R. Tovey.—Specimen of "Purple-haired Bramble," *Rubus phœnicolasius*, Maxim (Roseaceæ), a native of Japan, collected at Narbethong, January, 1917, by Mr. A. D. Hardy, F.L.S., reported as becoming established in that district.

By Mr. L. Thorn.—Two species of Silver Wattle Moths. The larvæ and perfect insect of *Thalaina clara*. A beautiful silvery white moth, with prominent brown marking resembling a "W" on the fore wings. *Thalaina punctilinea*, also with glossy white wings, but no marking. Both insects breed on the Silver Wattle, the larvæ feeding in September, the moth appearing in February, March, and April.

After the usual conversazione the meeting closed.

NOTES ON THE MIGRATORY LOCUST AND THE INVASION OF 1886.

By JAMES HILL.

(*Read before the Field Naturalists' Club of Victoria, 11th April*, 1921.)

THE "locust" to which these notes refer is known specifically as *Chortoicetes terminifera*, Walk., and belongs to the order Orthoptera (straight-winged), and is closely related to the grasshoppers. It is, however, in no way connected with the so-called "locusts" of Southern Victoria, which are species of Cicada, and belong to quite another order—the Hemiptera (half-winged)—an order of sucking insects, whereas the true locust is, as will be told later, a biting insect.

Residents of the Wimmera plains in 1886 have not easily forgotten the visit of the locusts in that year. They appeared about the end of February and beginning of March. As a resident of Kewell district, about twelve miles north-west of Murtoa, I had ample opportunities of seeing the destruction which can be caused by insects in enormous numbers. The country about Kewell had, at the time, plenty of green grass and self-sown wheat, six to eight inches high, which had come up in the stubble as the result of heavy rains a short time before—a rather unusual state of affairs during February and March in the Wimmera.

One day my attention was attracted by a few locusts flying from the north-west. These proved to be the forerunners of vast hordes that were to follow. When the great multitude arrived it was seen that they had chosen to visit Kewell for the purpose of depositing their eggs. This they commenced to do about the second week in March, and continued so doing for about two weeks. During this time they devoured every blade of green grass and wheat in the district. The eggs were deposited in the ground, from two to three and a quarter inches deep, by means of the insect's abdomen, which was inserted into the ground to that depth, two or three of the joints of the abdomen stretching out considerably longer than usual. Some of the holes were bored in soft crab-hole banks, others in the hard sand-rises. The eggs were placed in the bottoms of the holes in a leaning position, packed quite close together, from twenty to fifty eggs in each hole. They were about three-sixteenths of an inch in length, and filled about an inch at the bottom of the hole, the remainder of the hole being filled to the top with a white, frothy substance which hardened, and seemed to act as a protection from the depredations of other insects.

The eggs, which were laid in the middle of March, did not hatch until the next spring (October), although there was

plenty of hot weather at the end of March, in April, and part of May, during which I fully expected some of the eggs would have hatched, as I remembered that some three years before a small lot of locusts had laid their eggs in the beginning of January, the young insects emerging from the holes in about a month; but in the case of the 1886 insects there was no sign of life where the eggs were deposited all through the autumn and winter.

The ground was well soaked by the spring rains, but it did not seem to affect the eggs in any way, and early in November the locusts began to make their appearance in great numbers. When the eggs hatch the young burst from the shells, but still keep the leaning position as when in the egg, and appear perfectly helpless. They are closely packed together, with their heads upward, until the time arrives for them to emerge from their holes. They now begin to gain strength and move themselves a little, working themselves upwards through the frothy substance which has protected them up to that time.

As soon as the young locusts have reached the top of the hole and have free access to the air they immediately begin to cast their skins. This first moult occupies about one minute, and, if closely watched, it is possible to see the skin slip off the body. They are now of a light brown colour, and about three-sixteenths of an inch in length. They soon get darker, showing distinct markings. Thus they have changed in the space of two or three minutes from a life of torpor to one of activity, and we behold the lively little hopper now started on its journey of life, and travelling, when weather permits, till its journey ends in death.

The little creatures congregate together in their different bands, which cover various-sized areas of ground—some two or three yards square, others considerably larger. As soon as they join into these companies they begin to travel, all the bands seeming to take the same direction and keep to it until the insect is perfect and ready to join in one great army. The young locusts grow very rapidly. The bands, therefore, cover a greater area of ground, and travel a greater distance, each day, for as they grow stronger they jump or leap further each time.

When the time comes for their second moult they attach themselves to grass-stems, bushes, &c., with their heads downward. They are again in a state of torpor. The skin begins to split open on the top of the thorax and down the centre of the abdomen. The body is then freed from the skin by violent throes or movements of the insects, the skin being left hanging to its attachment. Again the insect soon hardens, considerably increased in size. The moult is accomplished in two or

three minutes, and the insect soon moves about again, and, joining a troop, begins to move forward again.

They are now in their third stage, in which they attain almost their full size. This stage lasts about twenty-four days, at the end of which they again cast their skins in the same manner as just described. The change is quickly completed, and it is difficult to see them in the act.

In the fourth stage, which is now commencing, the wings grow to their full size in the course of a few minutes, just as those of a moth or butterfly do on emerging from the chrysalis. They have at first very little colour, and are very soft, but they soon harden, and attain their proper colours.

As soon as the wings are hard the insects are ready for flight, which they do as soon as the sun is hot enough. They fly very direct, carrying the body in quite a level position, and appear to be able to fly an indefinite distance. Although the locusts have been in their several groups up to this time, they now combine into one migratory army, and carry destruction with them wherever they go. Finally, they halt to deposit their eggs, and after this act life departs, thus ridding the country for a time of one of the most destructive pests imaginable.

At the end of the year 1887 locusts again made their appearance in the Kewell district. On the 20th December the morning broke nice and fine; a light wind was blowing steadily from the north-east. Standing in a clear place where it was possible to see for a distance of half a mile or so, and looking towards where the wind was blowing from, about an hour before noon, apparently a dust-storm was to be seen in the distance, no other difference being noticeable beyond that a few more locusts than usual were flying about. However, in the course of a few minutes the dust-storm resolved itself into a moving mass of insects. The locusts had come, and come they did. They passed where I happened to be about as thickly as anywhere else. They were travelling at the rate of five or six miles an hour, and were so thick that a person could not see through them further than a quarter of a mile, and as high as you could distinguish them there were locusts. They were as thick as this for two miles wide, and continued passing for nearly five hours, the noise made by their wings sounding like the wind blowing in the tops of trees. Such an army of locusts would cover a great tract of country, but this was only a part of the army, for they continued passing from Tuesday, 20th December, to Saturday, 24th, whenever wind and weather permitted, though not so thick as on the Tuesday. From reports received the army must have been about fifteen miles wide. Who could express their numbers in figures?

At the time there was plenty of green grass, but where they

passed thick the grass fell before them like wheat before the sickle, for they levelled it as they went. Numbers of those which passed on the Saturday laid their eggs in small patches here and there, and if they had done so as they advanced the number of eggs laid is inconceivable. Thousands died while passing here, having probably arrived at maturity; they were usually found sticking on grass or bushes. A large number of the locusts were left behind, apparently not being able to travel any further; these also died in the course of a few days.

The eggs which were laid on Saturday, 24th December, matured, and the young locusts were coming out of the ground on the 12th January following, which, in this case, gives only nineteen days for the egg stage; thus it appears there is no definite time for their existence in the egg stage. I have come to the conclusion that the eggs require a certain amount of damp heat to cause them to hatch, for, after the eggs in this case were laid, there was enough rain to give the ground a good soaking, causing a damp heat, and thus making them hatch quickly.

Fortunately, like other insects, locusts are subject to many conditions which jeopardize their chances of arriving at full maturity. I remember one batch of locusts which were emerging from the holes for just a week, but two days after they were nearly all dead. Although they were so small, the ground was black with them. Their death was caused, no doubt, by the absence of food in the vicinity of their hatching. Thus Nature has her way of balancing countless hordes of insects, for if it were not the case the world and all that is therein would soon be a scene of desolation.

[Some interesting notes on the same subject, giving other details, will be found in the *Victorian Naturalist* for February, 1887 (vol. iii., p. 131).—ED. *Vict. Nat.*]

BOOK NOTICE.

GOLDEN WATTLE: Our National Emblem. By Archibald J. Campbell, Col. Mem. B.O.U. Melbourne: Osboldstone and Co. 63 pages, quarto, with 28 illustrations (5 in colour). 21 shillings.

In this volume the author, who is perhaps better known to Australians as an authority on birds' eggs than an exponent of the beauties of our Australian wattles, has produced a handsome book worthy of the subject. In a foreword, Sir W. J. Sowden, K.C.M.G., president of the Federal and South Australian Wattle Day Leagues, draws attention to the author's many achievements, not the least of which was the founding in 1899 of a Wattle Club, out of which has grown the customary Wattle Day

demonstrations of later years, and indirectly that love for native shrubs and trees which is gradually worming its way into the hearts of both professional and amateur gardeners. The letterpress of the volume is based on an illustrated paper read before the Field Naturalists' Club of Victoria on 13th September, 1909 (*Vict. Nat.*, xxvi., p. 86), entitled "Wattle-time, or Yellow-haired September." The latter designation is very apt, as the bulk of our acacias flower in September, though, as the author points out, species may be found in bloom, in some part of Australia, in every month of the year. Five of the plates are in colour, but the reproduction of wattles in their natural colours is still to be attained, though the printers have got very near it in one or two cases. There is a sort of transparency in the yellow which seems to be wanting in the prints. The "photo-pictures" are all from the author's camera, but it is questionable whether "the introduction of a figure for idealistic purposes" does not detract from the plates as wattle pictures, the figure occupying too prominent a position. However, the volume is a notable addition to our wattle literature, and deserves the support of an interested public. A copy of a leaflet issued by the Wattle League gives some details as to desirable species for cultivation in gardens.

Eagles and Hawks.—In the *South Australian Ornithologist* for July Mr. J. W. M'Gilp gives some very interesting notes about eagles and hawks, in which the usual beliefs about these birds are somewhat altered. He says the Wedge-tailed Eagle, commonly referred to as the "Eaglehawk," is claimed by many people to be a great destroyer of rabbits, and, therefore, of considerable benefit to pastoralists. This claim is based on the fact that large quantities of rabbits' bones may be found under the nests and feeding platforms of the birds. While admitting this evidence Mr. M'Gilp states that the eagle secures the greater part of its food from dingoes, foxes, cats, and hawks. The bird follows these animals in order to secure what they kill. When a fox has made a capture, often a rabbit, an eagle will swoop down, causing the fox to clear off, leaving its intended meal behind; this the eagle seizes in its talons and takes for itself. Eagles are not capable of rising from the ground with any great weight in their talons, as they require one foot to enable them to hop along the ground for a little distance before attempting to use their wings. They never carry any weight in their bills. The Little Eagle, he considers, is the best rabbit-killing bird. It is a most inoffensive bird, and never attacks lambs. On account of being despoiled of many of its kills by the Wedge-tailed Eagle it does not get credit for all the good work it does.

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The Victorian Naturalist:

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— OF —

The Field Naturalists' Club of Victoria.

Published 6th October, 1921.

Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	45
Nature Study Exhibition	47
Note	47
Aboriginal Coast Camps of Eastern Victoria. By G. Horne, V.D., M.A., M.D., Ch.B.	48
An Entomologist in Southern Queensland. By F. Erasmus Wilson	54

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Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 10th OCTOBER, 1921.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Mrs. Mattingley, 42 Canterbury Road, Canterbury.	Mr. G. Coghill.	Mr. J. Gabriel.
Miss Sybil Llewelyn, Merton Hall, Anderson Street, South Yarra.	Mr. A. D. Hardy, F.L.S.	Miss E. Bage.
Miss Stella Newey, 238 Brighton Road, Elsternwick.	Miss R. Chisholm.	Mr. E. E. Pescott, F.L.S.
Mr. V. Gray, Harp Road, East Kew.	Mr. A. D. Hardy, F.L.S.	Mr. F. Chapman, F.L.S.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for examination of Exhibits.

6. Reading of Papers and Discussion thereon.

   The Meeting being arranged as "Mueller Commemoration Night," short papers will be read as follows:—

   (*a*) By Mr. C. Daley, F.L.S.—"A Sketch of Mueller's Life."
   (*b*) By Mr. E. E. Pescott, F.L.S.—"Mueller's Published Works."
   (*c*) By Mr. F. G. A. Barnard—"Mueller's Botanical Exploration of Victoria."

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICE.

Subscriptions for 1921–22 are now due. Early payment will be greatly appreciated by the Hon. Treasurer and Committee.

Any change of address should be notified to the Hon. Secretary at once.

The Victorian Naturalist.

Vol. XXXVIII.—No. 6. OCTOBER 6, 1921. No. 454.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th September, 1921.

The president, Mr. F. Chapman, A.L.S., occupied the chair, and about 70 members and visitors were present.

CORRESPONDENCE.

From Her Excellency the Countess of Stradbroke, intimating that she would be pleased to open the wild-flower exhibition on 27th inst.

From the Mount William (Ararat) Tourist League, inviting the Club to hold a camp at Mount William or to join the League in a camp. Referred to the committee.

REPORTS.

A report of the excursion to Cheltenham on Saturday, 20th August, was given by the leader, Mr. J. Searle, who reported a large attendance of members, some thirty being present. The excursion had been arranged for pond-life, but, as the district is a favourite one with botanists, several of the party devoted themselves to botany. Being so early in the season, the ponds were found to be full of interest, owing to the larval forms of phyllopods present. These are delightful objects for microscopical study, and much time could be profitably spent in working out their life-histories. In a week or two the adult stage of many would be reached, and the laying of eggs be in progress. The latter possess the power of retaining the life-germ during the times the ponds are dried up, and of commencing a new life-cycle when the wet season again sets in. Among the species reognized in the captures were:—Phyllopoda.—Eulimnadia rivolensis, Limnetis Tatei. Cladocera.—Daphnia carinata, var. gravis, Pseudomoina lemnæ, Chydorus, sp. Copepoda.—Boeckella Saycei, B. oblonga, Brunella australis, Cyclops albidus. Rotifera.—Euchlanis, Monostylus, Anuræa cochlearis, Asplanchnopsis, Philodina, Lacinularia elliptica. Protozoa.—Uroglena volvox, Bursaria, sp., Volvox aurens. Desmids and diatoms in profusion. Egg-masses of Chironomus and Tanypus were numerous, the jelly-like mass of the latter containing numbers of Nematodes and other small worms.

A report of the excursion to Ringwood on Saturday, 3rd September, was given by the leader, Mr. C. Oke, who said that a small party of members took part in the outing. It was

decided to try the banks of the Mullum Mullum Creek, which flows on the southern side of "Pinemount." By careful search under bark, logs, leaves, &c., numerous insects, principally beetles, were found, though of small size. Flower-haunting insects were scarce, but the first buprestid of the season, *Melobasis suboyanea*, Kerr, was taken. Moss and grass-roots yielded further interesting species of beetles. Lepidoptera were scarce, the season being yet early, but a few larvæ were secured for home-rearing. Of hymenoptera and diptera few species were noted. As the day was fine, members returned to town well satisfied with the outing.

ELECTION OF MEMBERS.

On a ballot being taken, Mrs. L. Hodgson and Mr. L. Hodgson, Grange-avenue, Canterbury, were duly elected as ordinary members; Miss R. Currie, Lardner, as a country member; and Miss Margaret Swinburne, Kinkora-road, Hawthorn, as an associate member of the Club.

PAPER READ.

By Mr. Owen Jones, B.A., Dip. For., entitled "Our Forests."

The author laid stress upon the importance of the subject to all, timber and forest produce being essential to civilized existence. By means of a large number of lantern slides, kindly lent for the purpose by Mr. A. D. Hardy, F.L.S., the great beauty and value of our forests were illustrated, and a number of forest industries were portrayed. The relationship between forests and water supply, forests and agriculture, and forests and employment were detailed, and it was shown how the settler and the forester, instead of being antagonistic, were in reality mutually dependent. Forest fires, their causes, and the losses occasioned by them, were dealt with at some length, and suggestions were made as to how they might be minimized or prevented. The necessity for the introduction of conifers into Victoria was explained, and some interesting details were given as to the remarkable growth made by *Pinus insignis* at Bright on the tailings left by the gold dredges.

In a discussion which followed, the chairman, Messrs. Gabriel, Wisewould, Blake, and Pitcher took part.

EXHIBITS.

By Mr. C. Daley, F.L.S.—Flowering specimens of *Micromyrtus* (*Bæckea*) *microphylla*, *Pultenæa daphnoides*, *Grevillea linearis*, and *Thryptomene Mitchelliana*, grown at Caulfield; also portion of a Lawyer Palm, *Calamus australis*, pod of Cassia, sp., leaf of india-rubber tree, and leaves and fruit of *Coffea arabica*, from North Queensland.

By Mr. C. Oke.—Insects collected on Ringwood excursion.

By Mr. F. Pitcher. Flowers of *Eriostemon myoporoides*, Long-leaved Wax-flower, Vict.; *Hardenbergia monophylla*, Purple Coral Pea, Vict.; and *Chorizema ilicifolia*, Holly-leaved Flame Pea, Western Australia, grown on shaly ground at Punt Hill, South Yarra.

By Mr. A. L. Scott.—A spider and bee, taken at Ringwood. These were found in the cup of a flower, the bee quite dead, and the spider holding it tightly by the neck. The spider seemed to have little difficulty in carrying the much larger bee, and displayed great activity when trying to escape. The spider retained its hold on the bee's neck after being placed in the killing bottle.

After the usual conversazione the meeting closed.

Correction.—With reference to the exhibit by Mr. L. Thorn, recorded in the September *Naturalist*, the food plants of the moths exhibited should be—*Thalaina clara*, "W Moth," the Black Wattle, *Acacia decurrens*; and *T. punctilinea*, the Blackwood, *Acacia melanoxylon*—neither feeding on the Silver Wattle, the word "Silver" referring to the appearance of the perfect insect.

NATURE STUDY EXHIBITION.

In the report of the nature study exhibition in the August *Naturalist* (pp. 28, 29) several notable omissions occurred, due to lack of information about the exhibits. A fine display of blooms of winter-flowering Australian shrubs, &c., grown at the Melbourne Botanic Gardens, was made by the Director, Mr. J. Cronin, while Mr. F. Pitcher exhibited about twenty species of the smaller Victorian ferns obtained about Belgrave, as well as dried specimens of a number of the rarer Victorian species. Mr. J. H. Maiden, I.S.O., F.L.S., Director of the Sydney Botanic Gardens, forwarded a collection of New South Wales flowers, which, owing to delay in transit, did not arrive in time for exhibition; they were, however, utilized for teaching purposes in one of the public schools the following day, and so were not entirely wasted. The services of the lady friends of both societies, who, under Miss H. Gabriel, worked so energetically with the refreshments and in other ways, should not have been overlooked in the original report.

Wild-Flower Exhibition.—The annual exhibition of wild-flowers was held in the Melbourne Athenæum on Tuesday, 27th September. The exhibition was opened by the Countess of Stradbroke, and was well patronized by the general public. It was a financial success, and a full report will appear in the November *Naturalist*.

ABORIGINAL COAST CAMPS OF EASTERN VICTORIA.

By G. HORNE, V.D., M.A., M.D., Ch.B.

(*Read before the Field Naturalists' Club of Victoria, 9th May,* 1921.)

ALMOST anywhere along the Victorian coast, either at the steep sand-hill of Marlo or at the lower plain of Point Cook, a layer of shells can be found. It is the midden, or collection of shells whose contents have formed the food of the aborigines.

The places that I want to tell you about range from Cape Conran and Cape Ricardo, beyond Marlo on the Snowy River, through Prospect and the Ninety-Mile Beach, near Yarram, Venus Bay, from Cape Liptrap to Anderson's Inlet, Western Port, Port Phillip Bay, and the ocean coast-line past Bream Creek and Torquay.

Sometimes the wind has heaped sand high over the shells, so that they are hidden from view. Sometimes its action has stripped them bare so that many generations lie exposed. But when one starts to search for formed stone implements amongst these heaps of food-remains, their scarcity becomes apparent. Farther back chips seem common enough; but here, where the aborigines certainly lived, well-chipped models are very rare. Then the cause strikes one. These are the feeding-grounds of the tribes. For leagues they extend, ceasing to show themselves only where, as at Marlo, a new soil has been formed, leaving no shells to be seen, except where a cutting or a road lay bare a strata.

The feeding-grounds always lie near the water's edge, and, until one thinks of the years that have elapsed in their accumulation, they resemble much the deposits of the sea rather than the work of man. The presence of charcoal, mixed with emu fat, and the shells, show that this was not the case. It is found not only at Altona, but at spots all along the coast, mixed with the shells of the middens. Of course, near towns one doubts its authenticity, but on the Tarwin coast, twelve miles from the nearest township, and often many feet below the surface of the ground, it is obviously a genuine aboriginal production.

Generally, the sand is blown away from underneath the layers of shells, which drop down, falling on the ground immediately below. By that means layer after layer is added to the thick sheet until quite a heap of shells gathers where once a mound of sand existed. There seems no end to the possibilities of these layers having been formed. At Tarwin fifteen showed on one face, each pointing to a different period, perhaps years apart, that had yielded its spoils to the native. Some

PLATE II.

FIG. 1.—SHELL LAYERS OF THE MIDDENS, TARWIN.

FIG. 2.—FIRE STONES AT AVIATION SCHOOL.

of these were inches, some feet, apart. In the photograph (Fig. 1) my colleague is standing on a ledge. The layers dip far below.

The feeding-grounds are not entirely barren of finds. Occasionally an elaborately-worked implement is found, and at Tarwin some of the polished axes (not a great number) were picked up amongst the shell heaps. It is interesting to note two, which were found together, were of entirely different material, one being a diabase and the other an altered sandstone. It seems probable that some may come from the hills behind Waratah, at the head of Wilson's Promontory.

The characteristic stones found are three in number—hammers, anvils, and stones for knocking mollusca off the rocks. Hammers are sometimes well worked, and of hard material. They are found both where the shells show that the aboriginals fed and also on what I will describe to you later as the "chipping grounds." Usually those made of limestone were found. These softer hammers, though numerous enough upon the feeding-places, were not found amongst the chips where the manufacturing took place. The anvils, similarly, were also made of softer stone. It was always something found on the spot, and around the west coast of Port Phillip Bay was of a porous surface basalt. Down the coast from Queenscliff towards Cape Otway, however, this was changed for silicious limestone. Anvils are flattened stone, roughly hollowed on one or both sides. They are not found on the chipping beds, where one finds, instead, the hard stones, scarred with the marks of many blows, but they are common on the feeding-places. At Bream Creek, on the ocean beach near Geelong, enormous numbers are to be picked up. They were probably used to hold the shells that were being smashed with the hammers. The pits on them must not be confounded with the smaller marks for finger grips so commonly seen on hammers, axes, and other tools.

The third stone, for detaching molluscs, consists of a pebble of altered sandstone that has been steeply flaked along one side down to a plane surface. Especially are they found near the mouths of creeks where the supply of fresh water made it a suitable camp for the natives' permanent needs. Sometimes these stones are most elaborately finished, with secondary stepped retouch extending all round. Just such implements are found also far inland, and are called colloquially "shoes." But the typical rough-chipped stone belongs to the feeding-ground, and similar implements were used quite recently in Queensland for dislodging oysters. The battered edges on many show that they have had just such rough usage. There are other implements that are found on the eating-places—

small bone rods, about two inches long, smoothed down and sharpened at each end. These are fish-hooks. All along the coast, on the feeding-grounds, they can be found, but notably about three miles from Warrnambool. Tied with a cord in the middle, and baited, they straighten up at right angles to the line when it is being pulled taut. This sticks the sharp ends into the fishes' mouths. Three similar fish-hooks, made out of the central pillar of Voluta or Lotorium, were found touching each other at the Aviation School. Just such fish-hooks or gorges are used in France to this day.

The most significant of the evidences of former inhabitants of these feeding-grounds is, however, found in the fire-stones (Fig. 2), which, wherever suitable material exists, lie grouped in heaps throughout the camp. They consist, as a rule, of porous basalt. The fires were used by the aboriginals to keep themselves warm at night, for the stones held the heat long after the fire had died down. Curled up on one side near these they would lie with the thighs drawn up to cover the abdomen (White). My pictures are from five places—Point Cook, Altona, Aviation School, Torquay, and Tarwin—or, to be accurate, 12 miles from Lower Tarwin. These show the fire-stones on the feeding-ground at Tarwin. They do not seem to have been intended for cooking upon, for frequently no burnt shells are found in the neighbourhood. The pictures prove conclusively that they camped on the same place as they fed. The fire-stone groups, however, are not so numerous there as they are on the chipping grounds. They not only served for warmth, but also to roast such game as they captured. The chipping ground at Aviation is separated by a ridge of tea-tree from the feeding-place, as seen in the distance. At Torquay also the fire-stones are shown.

The shells which form these vast accumulations are, as a rule, mixed haphazard, but sometimes a few square feet are entirely composed of one particular variety. The mussel, *Mytilus planulatus*, is perhaps the most frequently so found, and it lies in close-packed heaps. The Mutton-fish, *Haliotis nævosa*, the large oyster, *Ostrea angasi*, and *Voluta undulata* are also separately grouped. At Bruny, Tasmania, crayfish claws are similarly found. How these collections of a particular mollusc come about is a mystery. They are not thrown down casually when eating, for they lie absolutely overlapping each other in a small area, and outside there will not be one of that variety. For some reason (possibly connected with ceremonies of beginning of fishing) they are carefully piled in position. This is quite a different cause from that which sometimes makes the bivalve *Donax deltoides* almost the only mollusc for a quarter of a mile or more, with only a few other varieties

scantily interspersed. Turbo, sp., and Voluta, sp., were evidently often cooked. This is seen by the charred fragments of their shells, particularly of the opercula of Turbo.

Amongst the mollusca eaten, *Donax deltoides* is by far the most common, large sheets of the shell covering the sand-hills, with few intervals, for miles. Locally, *Arca lobata*, *Austocohlea striolata*, *Haliotis nævosa*, *Turbo undulata* are frequently found. Sometimes individual species are so thick as to nearly exclude other varieties. Less common are *Cassis analinus*, *Chione strigosa*, *Purpura succincta*, *Patella tramoserica*, *Ostrea angasi* *Pecten asperiensis*, *Mytilus planulatus*, and *M. rostratus*; whilst occasionally one finds *Natica plumbea*, *Nerita melanotragus*, *Conus anemone*, *Cypræa angustata*, and *Potamides australis*. At Altona are found, in addition, the following: *Arca fasciata*, *Natica conica*, *Murex triformis*, *Cardium tenuicostatum*, *N. plumbea*, *Potamides australis*, *Bulla australis*, and *Cominella lineolata*.

However, it is to the chipping grounds that one first instinctively turns, for these are most emphatic proofs of the aborigines' industry. At Tarwin the line of demaraction between chipping and eating places is sharply delineated. In the picture the distance gives the low ridge of hummocks that closely follows the coast. On the sea slopes of this are found the shell mounds of which I have been speaking. In the foreground the sand is pushing inland, and gradually overwhelming the low scrub and stunted trees. Between the two there stretches a long valley, from 300 to 800 yards across. The shallow lagoons and swamps, not yet silted up, which lie in this area formerly harboured wildfowl. In the dried-up marshes one finds throwing stones that have been aimed at the birds, and were not recovered. From all this marsh area, from close up to the hummocks fringing the sea as far as ever the layer of sand has been swept away, chipping beds are to be found. No soft hammers or anvils for smashing shells are here, but where the wind has cleared a patch, or where the vegetation has held the soil together, the seeker is sure of a reward. This is not the only workshop at Tarwin, although by far the largest near this place. Wherever there is water—river, creek, lagoon, or swamp—there, as close as possible to the feeding spots, the workmen chipped out their implements.

It is often said that any stone might be used for any purpose by the aboriginal, and this is most true. Those who have lived amongst them can tell how a rough edge is chipped or flaked upon any casual pebble. It is used and thrown away. Similarly, any implement may be employed for purposes for which it was never designed. A polished axe is used to chip other stones, or as an anvil: a knife becomes a scraper; and

there is no tool which may not be made into a spokeshave. On the other hand, implements were definitely made by experts for definite purposes. This we know from those who have seen them at work. They all describe the old man who sits and chips continually, singing over his work "to make it good." Others fish or hunt or gather roots for him. He stored his trophies in a heap on the ground by his side. This is the specialist, and his work one finds on the chipping grounds. Most frequently it is noted in the making of those artifacts which require great skill and care, such as what one calls "thumb-nail scrapers" and "chipped-back" knives. These implements are found grouped close together, although scattered examples can also be picked up.

The feature of Tarwin, however, is the vast amount of quartz crystal and opaque quartz that can be found. These substances are most intractable to work, as they tend to flake down lines of cleavage. It is only by constant care and by accurate strokes that the correct form is attained. The result (especially with the crystal) when it is complete seems worth the trouble—knives with sharp point and razor edge, scrapers with the top finely chipped, as well as those with the long side serrated. The opaque quartz is similarly treated, and it, too, lies in patches, where all sorts of implements can be found. The material is got from pebbles and from veins which are broken up. One piece had been shaped into a throwing stone, and, although not entirely complete, the rough form is very apparent.

At Marlo and east from the Snowy as far as the country of the Biduelli the same material is in almost universal use. At Cape Conran nothing else was to be found. Ochre was very abundant. One mass of the red was hollowed into a round cavity, in which the substance was ground up. This piece also shows the knife marks where grooves have been cut into it to scrape some off. A grindstone was picked up that is thickly coated with the red ochre, and had evidently been used in getting ready for corroboree. Red ochre is used by the local farmers for marking their sheep.

The basalt of Williamstown appears to be unfruitful, but, further on, Altona will at any time give a rich harvest. Here, as at many other places round the Bay, eating-grounds and workshop alike are buried. Where, however, a wheel-track cuts through the surface, the wind speedily does the rest. This is about eight miles (as the crow flies) from the G.P.O. It is dotted all over with the week-end shanties of the Footscray and Newport people: but at this spot we got our richest haul of chipped-back knives and thumb-nail scrapers ("grattoirs" of French schools). The hedge forms the corner of a fowl-run,

and inside as well as outside these artifacts were to be picked up by the score. The feeding-ground is quite close—seen on the right of the photograph, where the shells and but few chips appear. The oyster *Ostrea angasi* is much in evidence, though, I am told, it is disappearing from these waters. On the left is the workshop, within a few feet of the eating-place. A feature of this district is the use of tachylite, which, according to Mr. R. A. Keble, of the Geological Museum, must have come from Carlsruhe, 50 miles away.

One last point: the relative frequency with which skeletons are found on the feeding-places of the aborigines. Three of these were at Tarwin, one at Altona, and two at the Aviation School. One also was found at Coffin Bay, Eyre Peninsula, South Australia. Of only two of these was it possible to say that a definite burial had taken place; the others were groups of the long bones and fragments of cranium and vertebræ. The two were buried in shallow sand graves, from which the surface had been blown away, leaving the top of the cranium uncovered. These were in the squatting position, and facing the east (*vide* Howitt, p. 454).

We thus see that there was a division of the camp into feeding-ground and workshop. On the feeding-ground some lived, and others visited them at times. Sometimes the molluscs were knocked off the rocks with stones. They might be cooked and the contents picked out, or the shell might be smashed and the mollusc eaten raw. At the workshop specialists and others chipped out their implements. They busied themselves with the hunting and fishing with hook and line, for scrapers are picked up, and spokeshaves for sharpening their spears, as well as the straight bones that served as hooks.

Corroborees filled a not unimportant moiety of their time, for the ochre has come down to us. The vegetable food was supplied by roots and water-plants pounded with upper and nether stones that we find. They stalked the wildfowl in the lagoons, for their throwing-stones are there discovered. Sometimes their axes, and frequently boomerangs and throwing-clubs, were polished and smoothed down, sitting in the shade of a tree. In default of an opossum's tooth, a point scraper was used for scratching the designs which decorated the wooden implements. This had gone on for generations, as witness the many layers of shells. Finally, when they died they were buried with their knees drawn up, looking out to the east, in the soft sand near the sea.

[The paper was illustrated by a large series of lantern slides.—ED. *Vict. Nat.*]

AN ENTOMOLOGIST IN SOUTHERN QUEENSLAND.

By F. ERASMUS WILSON.

(*Read before the Field Naturalists' Club of Victoria, 11th July, 1921.*)

QUEENSLAND, the Mecca of all southern entomologists, had long called me, but it was not till last October that I was afforded an opportunity of making the trip. Taking my wife with me, I travelled overland so as to save as much time as possible, and saw much of interest during the long if somewhat tedious train journey of 1,300 miles. The country between Melbourne and Sydney was familiar to me, but, after leaving Sydney, at many an inviting locality I heartily wished that the train would develop some shortcoming and enable me to obtain an hour or so collecting. However, all went well with the "iron horse."

After leaving the border station, Wallangarra, I was particularly interested in seeing the pine-clad ridges of the Macpherson Ranges, which reminded me somewhat of pictures I had seen of pine country in North America. The country hereabouts is wonderfully rocky, and it is here that the new Lyre-bird has recently been found, although unknown to ornithologists at the time of my visit. It is certainly the last place in the world that I should have expected to be tenanted by a Menura. Many very beautiful wild-flowers were noticed growing amongst the rocks, but the speed of the narrow-gauge train was too fast for me to be able to form an opinion as to their probable identity.

During the passage of the Darling Downs, which was a veritable Garden of Eden, thousands of the pretty little yellow butterfly, *Terias smilax*, Don., were observed, and at King's Creek the first Queensland beetle introduced itself by flying into the carriage and alighting on my coat. This I considered a good omen. However, I was able to greet it as an old friend, as I quickly recognized it as the noxious Pumpkin Beetle, so plentiful in our own State. On the margins of the muddy creek beneath the station a pair of Black-fronted Dottrels were feeding, whilst the sweet notes of Reed-Warblers issued from a neighbouring bed of reeds. At Toowoomba I was greatly struck with the huge honour-board that is erected in the station premises, and which testified as to the great patriotism of the local inhabitants. The scenery encountered after leaving this station is indeed magnificent, and many things of interest came under notice. Here I saw for the first time the football-like Termitaria attached to the sides of trees, and here also I caught my first glimpse of that avian gem, the Variegated Wren, *Malurus lamberti*. Along the banks of a creek the scarlet-flowering Callistemons made a great show, and a few

Silky Oaks, *Grevillea robusta*, with their yellowish flowers, were also noticed. On reaching the flats again I saw another form of Termitarium, consisting of a small mound about two feet in height, constructed of yellow earth. These were scattered over the paddocks in hundreds, and were quite a feature of the landscape. The white ant that builds these structures apparently feeds on grass, as in opening a mound at a later date I found most of the passages filled with dead grass. Owing to the fact that the mounds are so numerous, they must be a serious handicap to the pastoralist, as, apart from the grass-collecting propensities of the termites, the mounds take up a considerable area of the possible grass-growing land in each paddock.

Brisbane is not reached until nightfall, so one does not get one's first impression of the northern capital until the following morning. Our host, Mr. H. S. Pottenger, with whom I had spent many a pleasant collecting trip around Melbourne, welcomed us at the station. The next few days were spent in visiting the entomological brethren in Brisbane, whom formerly I knew only by repute. A very interesting morning was spent with Mr. Tryon and Mr. Jarvis at the Department of Agriculture, and an examination made of the departmental collection. Another delightful morning was passed with Mr. White, the Government Botanist, at the Herbarium and Botanical Gardens. Several beautiful orchids were flowering in the open fernery, and gorgeous flowering shrubs everywhere attracted my notice. The enormous bamboos, some 50 or 60 feet in height, with great thick canes in proportion, were a feature at the gardens, and I am told that, when a brake of these gets fired, the noise is deafening, owing to the explosions of the large air-tight compartments between each node.

Mr. Longman, the director, and Mr. Hacker, the entomologist, both contrived to make my visits to the Museum of absorbing interest, and very kindly placed some of the Museum duplicate boxes at my disposal. I was thus enabled to add several very fine Queensland beetles to my collection. The entomological display in the main body of the Museum is indeed a splendid one, and far ahead of anything to be seen in either the Sydney or Melbourne Museums, and testifies to the excellent work done by Mr. Hacker. The reference collections are also very extensive, and particularly rich in some groups. I was also greatly pleased to have an opportunity of meeting Mr. K. Illidge and viewing his extensive collection of Coleoptera. Mr. Illidge's kindly manner instantly puts one at ease, and I learned many interesting facts on beetle life during my conversation with him. He has bred a very large proportion of the specimens in his collection, and consequently so many of them are

in the most perfect condition. His Cerambycidæ are worth going far to see.

After weighing the merits of Mount Tambourine and the Blackall Ranges, Mr. Pottenger and I decided to have a few days' collecting at the latter locality, and started away early one morning for Montville, which is situated at the highest point of the ranges. We travelled by train to Palmwoods, some 60 miles north of Brisbane, and thence by coach. On the train journey up we passed some very fine clumps of cabbage palms growing in their natural surroundings, and several epiphytal orchids, growing high up in the trees, were observed. I noticed that the common Native Shot, or Meat Ant, *Iridomyrmex detectus*, here seemed to construct their mounds much higher than they do in Victoria. This ant is perhaps the most widely distributed of all, as it occurs in all the States of the Commonwealth. Whilst waiting for the coach at Palmwoods I was fortunate in getting a view at close quarters of a Large-headed Shrike-Robin, *Pœcilodryas capito*, Gould. After a six-mile drive up the hills, through beautiful country, we reached our destination, "Elston," from the verandah of which one can gaze across a vast rolling valley, and see in the distance the blue waters of the Pacific. However, admiring views was not the order of the day, so, seizing our collecting kit, we were soon deep in the recesses of the dense tropical scrub, or "rain forest," as Mr. White says it should be called. Much time was spent in beating the various vines that abound in these scrubs, but they did not exactly rain Coleoptera. In this way I collected numbers of the carabs *Colpodes Lafertei*, Montr., and *Xanthophœa rufescens*, Macl., also two species of Staphylinidæ, one of which was a handsome Pæderus. Amongst the longicorns shaken from the scrub were *Velova sordida*, Pasc., and *Porithea plagiata*, Blackb. Some very fine weevils belonging to the sub-family Cryptorhynchides, and some nice Chrysomelidæ, also fell into our umbrellas. From an old rotten log I dug out a fine example of the huge passalid, *Mastochilus capitalis*, Blackb., and near by secured my first specimen of *Pamborus Guerini*, Gary. Here we came across the only tree-fern seen on the trip—a species of Alsophila. Remembering that weevils belonging to the sub-family Cossonidæ breed in the dead frond-pith of our Victorian Dicksonias, I secured some fronds, but was disappointed to find that they were all hollow. From the under surface of a Polyporus fungus several specimens of the dainty little erotylid, *Episcaphula australis*, Bois., were collected, and another member of the same genus, *E. rufolineata*, Wilson MSS., was shaken from a clump of dead leaves.

(*To be continued.*)

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— OF —

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Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	57
Exhibition of Wild-Flowers	61
Note	63
An Entomologist in Southern Queensland (*continued*). By F. Erasmus Wilson	64

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Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 14th NOVEMBER, 1921.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Miss Margt. Guerin, West Bourke Hotel, Queen St., Melbourne.	Miss R. Currie.	Mrs. E. Cox.
Mr. E. O. Boase, Ivanhoe.	Mr. P. R. H. St. John.	Mr. A. S. Blake.
Mr. Arthur Jones, 116 Eglinton Street, Kew.	Mr. F. G. A. Barnard.	Mr. P. R. H. St. John.
Mr. A. E. Rodda, Norwood Avenue, Brighton.	Mr. F. Chapman, A.L.S.	Mr. R. Keble.
As Country Member—		
Mr. H. M. Collins, "Gracehill," Frankston.	Mr. J. Mann.	Mr. F. Pitcher.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for examination of Exhibits.

6. Reading of Papers and Discussion thereon.

   "Notes from the Mallee," illustrated with lantern slides.
   (*a*) Ornithology—Mr. C. L. Barrett, C.M.Z.S.
   (*b*) Botany—Mr. H. B. Williamson.
   (*c*) Geology—Mr. F. Chapman, A.L.S.

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICE.

Subscriptions for 1921–22 are now due. Early payment will be greatly appreciated by the Hon. Treasurer and Committee.

Any change of address should be notified to the Hon. Secretary at once.

The Victorian Naturalist.

Vol. XXXVIII.—No. 7. NOVEMBER 10, 1921. No. 455.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday, 16th October, 1921.

The president, Mr. F. Chapman, A.L.S., occupied the chair, and about 80 members and visitors were present.

REPORTS.

A report of the excursion to Boronia (Ferntree Gully line), on Saturday, 17th September, was given by the leader, Mr. F. G. A. Barnard, who reported a good attendance of members. Wild-flowers of any note were scarce, but the party enjoyed a short ramble over some of the foothills of One Tree Hill, and also made a visit to the garden of the Hon. A. E. Chandler, where quantities of the Western Australian boronia and everlastings are grown for market purposes, as also daffodils, which made a very fine display.

A report of the excursion to Werribee Gorge on Thursday, 22nd September (Show Day), was given by the leaders, Messrs. Scott and Tadgell. The former, dealing with the general results of the excursion, said that it was enjoyed by all. The party drove out from Bacchus Marsh to near the junction of the Myrniong Creek with the Werribee, where attention was called to the folding of the Silurian rocks. Proceeding up the latter stream the contact of the granite with the Silurian was examined. Returning down stream an inspection was made of the contact between the glacial deposits and the Ordovician. Later the track to the table-land was followed, and many fine views of the Gorge obtained. Some attention was also paid to botany, Mr. Tadgell reporting that nearly one hundred plants were noted in flower, of which about sixty had been exhibited at the recent wild-flower exhibition, the principal of which were Zygophyllum, sp., *Eucalyptus leucoxylon*, *E. Behriana*; the tree violet, *Hymenanthera Banksii*; *Acacia acinacea*, *A. montana*, *Cassia eremophila*, and *Myoporum viscosum*. The orchids *Caladenia carnea*, *Diuris maculata*, and *Pterostylis curta* were found blooming freely, while six ferns were noted, of which *Pteris arguta* was the rarest. Introduced plants occurred in considerable numbers, *Solanum pseudocapsicum*, with its showy red fruits, being very conspicuous.

A report of the excursion from Mitcham to Ringwood on Saturday, 24th September, was given by Mr. J. Stickland, who said that the outing was well attended, and favoured by a beautiful afternoon. His co-leader, Mr. F. Chapman, A.L.S.,

had given an interesting outline of the physiography of the district from an elevated spot overlooking the Mullum Mullum or Deep Creek valley, and evidences of early life had been found in the mudstone on the banks of the creek. As regards pond-life, in which he was most interested, the results were rather meagre, owing to the absence of permanent pools on the route taken.

A report of the excursion to Bendigo on Saturday, 1st October, was forwarded by Mr. D. Paton, one of the leaders, and read by Mr. C. Daley, who acted as co-leader. Ten members made the 200-mile trip, and were favoured with splendid weather. Flowers were found in large numbers, and, owing to the lateness of the season, many species were obtained which had not been recorded on the previous excursions to the district, at least one hundred species of plants being found in bloom. The entomologists of the party also did well, but birds were somewhat scarce, the most interesting ornithological occurrence being the finding of a fly-catcher's nest containing one egg with a cuckoo's egg in addition.

A hearty vote of thanks was passed to Mr. Paton for the very great trouble he has taken in planning the Bendigo outings, which have become an annual feature in the Club's programme.

ELECTION OF MEMBERS.

On a ballot being taken, Mrs. Mattingley, 42 Canterbury-road, Canterbury; Miss Sybil Llewelyn, "Merton Hall," Anderson-street, South Yarra; Miss Stella Newey, 238 Brighton-road, Elsternwick; and Mr. V. Gray, Harp-road, East Kew, were duly elected as ordinary members of the Club.

PAPERS READ.

The chairman announced that, as the day was the twenty-fifth anniversary of the death of the late Baron Sir F. von Mueller, for forty-five years Government Botanist of Victoria, and an enthusiastic supporter and patron of the Club, the committee had arranged for a series of papers dealing with various aspects of his life.

1. By Mr. C. Daley, F.L.S., entitled "A Sketch of Mueller's Life." The author gave at some length the story of Mueller's achievements, from his early botanical studies at the University of Kiel to his death as one of the most eminent of modern botanists, particularly in systematic work, and one who had made the elucidation of the Australian flora essentially his life-work. [Details of his life will be found in the *Victorian Naturalist* for October, 1896 (vol. xiii., p. 87).—Ed.]

2. By Mr. E. E. Pescott, F.L.S., entitled "Notes on Mueller's Published Works." The author remarked that he and others greatly regretted that no published bibliography of Mueller's

writings existed. These were so extensive, and had appeared in so many languages in all parts of the world, that the task was a very difficult one; still, he thought, as a memorial of the greatest of Australian botanists, some effort should be made to compile and publish the story of Mueller's life and works, in view of the centenary of his birth, which will occur in 1925. He said he had devoted some attention to collecting his smaller published writings, and exhibited several of them in illustration of his remarks.

3. By Mr. F. G. A. Barnard, entitled "Mueller's Botanical Exploration of Victoria." The author said that nearly twenty years ago he had given before the Club (*Vict. Nat.*, June, 1904, xxi., p. 17) some account of the three wonderful journeys Mueller had made in 1852–5 through parts of Victoria still almost untrodden, and which he pointed out on the map of the State. The first—in the spring of 1852—traversed the route of the Sydney road to Beechworth, thence to the Buffalo Mountains, Mount Buller, Plenty Ranges, head of Latrobe River, Gippsland, to Wilson's Promontory, estimated at 1,500 miles. The second, in 1853, was to the Grampians, thence to junction of Murray and Darling, up the Murray to the Mitta Valley, thence to Omeo and the Alps, on to the Cobberas, thence to the Snowy River, and back to Melbourne by the main Gippsland road, estimated at 2,500 miles. The third of these wonderful journeys was through the Dandenongs to the Latrobe, thence to the Avon and up to Mount Wellington, thence by the Mitchell and Dargo to Omeo, and on to Mount Bogong, back to Omeo and on to Kosciusko, returning to Buchan, Cabbage-tree Creek, and by the main Gippsland road to Melbourne. This must also have amounted to fully 1,000 miles. He wrote to Sir W. Hooker from Omeo, saying he had "exhausted the alpine flora, and had wandered for days without seeing a new species." No wonder collectors of later years have found it difficult to find a new species. He said it would be impossible to say how many species Mueller added to the flora of Victoria and Australia during these expeditions, which were carried out quite alone, and without any elaborate preparations; but a very low estimate would be at least 1,000 species, a large proportion of which were new to science. Later visits were made to the Genoa River, the Baw Baw Mountains, and to the sources of the Macallister. He had also visited Arnhem's Land (North-West Australia), and twice collected in Western Australia.

Mr. H. B. Williamson gave a description of his first interview with the late Baron and of the encouragement he had received to continue his botanical work.

Mr. F. Chapman, F.L.S., said that the late Baron was also a palæobotanist of high standing, and had determined many specimens for the Geological Survey of Victoria, while Schenk,

in his writings on fossil coniferous woods, had attached his name to a Phyllocladus (*P. Muelleri*) from the deep leads of Ballarat, and exhibited specimens in illustration of his remarks.

EXHIBITS.

By Mr. F. Chapman, A.L.S.—Fossil fruits from the Deep Leads of Victoria, named by Baron van Mueller, including *Pentcune trachyclinis* (Sapindaceæ), *Spondylostrobus Smythi* (Coniferæ), and *Plesiocapparis megasperma* (Capparideæ): copies of decades 1 and 2 of Mueller's "Observations on New Vegetable Fossils"; a slab of Middle Cambrian slate showing well-preserved remains of a brachiopod, *Marella splendens*, from Burgess Co., British Columbia, with a recent specimen of Lepidurus (Nat. Mus. Coll.) from Wentworth for comparison.

By Mr. G. Coghill.—Cultivated native flowers—viz., *Grevillea rosmarinifolia*, *Daviesia latifolia*, *Goodia lotifolia*, and *Leptospermum lævigatum*; also herbarium specimens named by Baron von Mueller.

By Mr. A. D. Hardy, F.L.S.—Photograph of Baron von Mueller at 35 years of age.

By Miss G. Nokes.—Flowers of *Eriostemon correifolius*, *Dampiera stricta*, *Baeckea diffusa*, *Comespermum ericinum*, *Pimelea axiflora*, &c., from Toorourrong, Plenty Ranges; *Boronia anemonifolia*, *Calythrix tetragona*, and *Baeckea diffusa*, from Bendigo; *Calochilus Robertsoni* (Father Christmas Orchid), from Rushworth.

By Mr. C. Oke.—Fifty species of Coleoptera from Bendigo excursion, ten of which were ants' nest enquilines, including four species of Articeras, *Paussilinus latericornus*, Lea, and Chlamydopsis, sp. nov.; also two Gecko lizards.

By Mr. E. E. Pescott, F.L.S.—Rare books and pamphlets published by Baron von Mueller; the *Argus* biographical notice of the Baron's death; copy of the hymn-sheet used at the Baron's funeral.

By Messrs. Pescott and French.—List in the Baron's writing of his last exhibits at a Club meeting, September, 1896 (three weeks before his death).

By Mr. F. Pitcher.—Flowering specimens of *Acacia Riceana*, Henslow, grown from seed by Mr. T. S. Hart, M.A., at Scoresby; on behalf of Mr. J. A. Ross, Nanneella, photographs of Southern Stone-Plover, *Burhinus grallarius*, taken at Rochester, and of Koalas (mother and young) taken at Inverloch.

By Mr. J. Searle.—Photograph of Baron von Mueller; larvæ and pupa of Simulium, sp.; larva of aquatic beetle, showing peculiar branchial process (under microscope).

By Mr. J. R. Tovey, on behalf of National Herbarium.—Collection of plants named after Baron von Mueller; also MS. bibliography of the Baron's publications.

By Mr. L. Thorn.—Two species of butterflies and twenty-three species of moths collected during Club excursion to Bendigo, including *Candalides hyacintha simplexa*; also Little Whip Snake, *Hoplocephalus flagellum*, M'Coy, from Cheltenham.

By Mr. H. B. Williamson.—Dried specimens of *Arthrocnemum halocnemoides*, Nees., var. *pergranulatum*, J. M. Black; and *A. leiostachyum*, Nees., two species hitherto regarded as *Salicornia arbuscula*, R. Br.; also *Kochia triptera*, Benth.—all determined by Mr. J. M. Black, of Adelaide.

After the usual conversazione the meeting terminated.

EXHIBITION OF WILD-FLOWERS.

Owing to the regulations under which the Melbourne Town Hall is let, it was impossible to secure it for the annual exhibition of wild-flowers, fixed for Tuesday, 27th September, hence the Club was compelled to make use of the Athenæum Hall. This proved totally inadequate to accommodate either the flowers or those who desired to see them, thus causing considerable disappointment to many who wished to leisurely study the exhibits, besides which the closeness of the atmosphere soon had a very detrimental effect on the flowers.

Her Excellency the Countess of Stradbroke had kindly consented to formally open the display, and the president, Mr. F. Chapman, A.L.S., in welcoming Her Excellency, briefly referred to the aims and objects of the Club.

Lady Stradbroke expressed the pleasure it gave her to be present that afternoon. Since her arrival in Victoria she had been greatly interested in the wild-flowers and the birds, of which she had heard very little in England. The love of wild-flowers ought to be encouraged as much as possible among the children. It was the love of the buttercups and daisies of England which had done so much towards making the Englishman love and be proud of his country, and Australian children should be taught to love and take interest in their birds, their gum trees, and their flowers, and all the blessings which they are privileged to enjoy.

Lady Stradbroke made an inspection of the exhibits, and was presented by Miss W. Chapman with a bouquet of wild-flowers.

A very fine collection of Australian flowers grown at the Melbourne Botanic Gardens was forwarded by the Director, Mr. J. Cronin, F.R.H.S., and, with palm-leaves and ferns, made an attractive feature on the platform. Here were to be seen specimens of the Waratah (N.S.W.), Geraldton Wax-flower (W.A.), Hovea (W.A.), Boronia (N.S.W.), &c.

Cultivated flowers were also shown by Mr. G. Coghill, of

Canterbury; Mr. E. O. Boase, of Ivanhoe; the Burnley School of Horticulture, and others, while Mr. J. H. Maiden, F.L.S., director of the Botanic Gardens, Sydney, forwarded a representative collection of New South Wales flowers.

The display of orchids made by Messrs. E. E. Pescott, F.L.S., and C. French, jun., in which they were assisted by Mrs. and the Misses Coleman, Miss Fuller, Miss B. Pillond, Messrs. F. Taylor, J. Gabriel, G. Coghill, F. Wisewould, and W. H. Nicholls, was a feature of the exhibition. Between forty and fifty species were represented, some of the novelties being *Dendrobium elongatum*, *Sarcochilus falcatus*, *Pterostylis mutica*, *Caladenia cucullata*, *Lyperanthus* (*Caladenia*) *suaveolens*, *Burnettia cuneata*, and *Glossodia major* (white form).

Many districts were well represented. Mr. G. Coghill had scoured the Taradale district, with excellent results; Mr. D. J. Paton forwarded a fine collection from Bendigo; Mr. J. C. Goudie from Maldon; Mr. A. J. Tadgell from Werribee Gorge, &c.

With the view of encouraging the growth of native plants the committee had made arrangements with certain nurseymen for a supply of the more attractive shrubs in pots. These were in great demand, as well as bunches of cut flowers, such as the Bendigo boronia and wax-flower, the lavender Swainsona from Ruthergien, &c. In fact, the demand for flowers was so great that long before closing time the stalls were practically empty. If, as the result of these annual exhibitions, a desire to grow some of our native plants in suburban gardens has been created, then one of the ideals of their promoters will have been accomplished.

Botanical objects under microscopes were exhibited by several members, and proved a great source of interest to numerous visitors, particularly students from colleges and schools, who were present in large numbers.

Through the district foresters, Mr. A. D. Hardy, F.L.S., was enabled to make a display of foliage and flowers of about 40 species of eucalypts on behalf of the Forest Commission.

From Broken Hill came a fine display of Sturt's Desert Pea, forwarded by Dr. Macgillivray, a country member. Western Australia was represented by many attractive species, which had borne the long journey well, while the Adelaide Field Naturalists' Club also forwarded a contribution.

Unfortunately, the hurried manner in which the parcels have to be opened up and staged prevents anything like a complete list of the flowers exhibited being compiled, but it may be safely said that the exhibition compared favourably with any of its predecessors for novelty and variety in the exhibits.

The list of members and friends who forwarded flowers is very incomplete, owing to the fact that many persons omitted to

enclose either the name of sender or where the flowers were collected. The following are the localities and names of senders as far as could be ascertained :—New South Wales.—Mr. J. H. Maiden, I.S.O., Botanic Gardens, Sydney; Mrs. J. Doyle, Northcote-avenue, Sydney; Dr. Macgillivray, Broken Hill. South Australia.—Mr. E. Ising, Adelaide. Western Australia.—Mr. ——, per Miss Fuller. Victoria.—Ouyen—Mr. H. B. Williamson; Speed—Mr. G. Arnold: Ultimo—Mr. J. Buckley, Mr. — Baldwin; Stawell—Mr. C D'Alton: Mount William, Moyston—Mr. — Fernie: Bendigo—Mr. D. J. Paton, Mr. H. C. James, Mr. J. Semmens, Mr. G. Green; Dingee—Mrs. J. Grylls; Maldon—Mr. J. C. Goudie; Taradale—Mr. G. Coghill; Chiltern—Miss Boucher; Springhurst, Miss Turner: Moe—Mr. M. A. Ward: Myrtlebank—Miss Warren; Heyfield—Mrs. Best; Nowa Nowa—Mr. D. M'Lachlan; Briagolong—Mr. J. Firth; Dandenong—Mr. H. B. Williamson; Yarram—Mr. A. K. Small; Neerim South—Mr. V. Heyden: Wilson's Promontory—Mr. W. J. Cripps (ranger): Pakenham—Mr. F. Wisewould: Ringwood—Mr. F G. A. Barnard; Evelyn—Mr. C. Oke, Mr. Earle; Mount Dandenong—Master M. Metzger; Belgrave—Mr. F. Pitcher; Greensborough—Mr. Ford; Sandringham—Miss Fordyce; Parkdale—Miss Hodgson: Frankston—Mr. J. W. Audas (45 species); Ivanhoe—Mr. A. Blake, Mr. E. O. Boase: Balwyn—Mr. F. Chapman.

The providing of afternoon tea and other refreshments was in the hands of Miss Gabriel and a number of lady friends, resulting in a considerable addition to the financial results. The attendance numbered about 3,000, which will enable a substantial amount to be placed to the credit of the publishing fund.

In order to ascertain the flowers most favoured by the public a vote was taken by means of slips deposited in a box at the door, and, while interesting, it cannot be taken as more than the opinions of a few, for many felt themselves unable to vote with confidence on the question. The result, however, placed the Bendigo Wax-flower, *Eriostemon obovalis*, first, with the Waratah (N.S.W.) second, the Pink-flowered Ironbark (*Eucalyptus leucoxylon*), the orchid *Glossodia major*, the Grampian Myrtle (*Thryptomene*), and Pink Eyes (*Tetratheca*) being equal in popularity. These six flowers are illustrated in the November issue of the *Home Gardener*.

A Mallee National Park.—There seems to be some chance of a sanctuary for animal life and plants being created in the vicinity of Lake Albacutya, about 20 miles north-west of Rainbow, where a tract of land of about 16,000 acres, useless for farming purposes, but eminently suitable for natural history requirements, has been gazetted as a National Park.

AN ENTOMOLOGIST IN SOUTHERN QUEENSLAND.

By F. ERASMUS WILSON.

(*Read before the Field Naturalists' Club of Victoria, 11th July, 1921.*)

(*Continued from page 56.*)

I was not long in that gully before I learnt what lawyer-vine was (I presume so named from the fact that when once you get into its toils you have great difficulty in getting out again). However, after getting my face mixed up with two or three of its saw-toothed tendrils, I learned to pay great respect to this member of the Queensland flora. Seeing a beautiful shrub with leaves some ten or twelve inches in width, I remembered having heard that in Queensland many insects rest on the under surface of large leaves. I was not long in getting my umbrella beneath a branch, and was soon vigorously hammering the tree with my beater. In doing so I brought my bare arm into contact with a portion of the plant, and was thus enabled to establish the identity of still another example of the famous Queensland vegetation, for it was the veritable Giant Urtica, or Stinging Tree. It set up a violent irritation which lasted for a couple of hours, and recurred every time I washed the affected part for two days afterwards. On raising a stone I found another old Victorian friend in the Bombardier Carab, *Pherosophus verticalis*, Dej., and another stone sheltered a specimen of *Cardiothorax aratus*, Pasc. I was particularly fortunate in obtaining a specimen of *Adelium delicatulum*, Cart., of which Mr. Carter tells me he had only previously seen the two type-specimens. Another very handsome tenebrionid that occurred in this gully was *Seirotrana Mastersi*, Macl., and I also secured a beautiful colour variety of *Licinoma elata*, Pasc.

On the outer edge of the scrub there grew a tree with inconspicuous though sweet-smelling flowers, which yielded splendid results to the collecting umbrella. I was particularly delighted to capture a pair of the rainbow-hued chrysomelid, *Spilopyra sumptuosa*, Baly., a most tropical-looking insect. This tree seemed to be very attractive to the Malacoderm family, the following six species falling into my umbrella:—*Carphurus pallidipennis*, Macl., *C. telephoroides*, Fairm., *Belanophorus rhagonychinus*, Fairm., *Heteromastrix luridicollis*, Macl., *Selenurus*, v. *flavius*, Lea, and *Telephorus flavipennis*, Macl., a wonderful haul from a single small tree. Some richly-coloured Coccinellidæ, or Ladybirds, besides several other interesting though small fry, also awarded our attentions.

One day we set out along the range in a northerly direction. The morning was calm and hot, and as we passed along between the dense thickets of the introduced Lantana we were awe-struck

with the beauty of the butterfly hosts that met our gaze. They were there in thousands, from the busy little Hesperidæ, or Skippers, even up to the gorgeous green, velvet-winged Ornithopteras, or Bird's-wing butterflies. Papilios, or Swallow-tails, were there in force, perhaps the most common being *P. Macleayanus*, a somewhat rare butterfly as far as Victoria is concerned. The whites and yellows were extremely plentiful, and the lycænids or blues were also well represented. I had not conceived it possible that such a wonderful variety, in such numbers, could be congregated into such a small area. Lewin's Honey-eaters were very plentiful in this locality, and looked most graceful as they darted in and out amongst the dainty pink blossoms of the Lantana. Though this plant seems to be a dreadful scourge in Queensland, I was informed that it is fairly easily destroyed, and that the land upon which it has grown is generally considered to have been improved by its presence. On a banksia tree I found a pair of the rather handsome weevil, *Leptops maleficus*, Lea, and, near by, a couple of very nice species of Onthophagus. An old fig log proved to be a happy hunting-ground for Tenebrionidæ, as from it we obtained *Hypaulax ovalis*, Bates, *H. foveatus*, Blackb., *Promethis quadricollis*, Pasc., *Ulodica hispida*, Pasc., and the old familiar *Uloma Westwoodi*, Pasc.

A narrow track leading from the road into the recesses of a dense growth of tropical scrub looked inviting, so, leaving the bright sunlight, we slid down a declivous passage into the darker scrub. Some feet of the nether end of a large, fat snake, disappearing into the thick carpet of fallen leaves, sent an unpleasant feeling down my spine, but I was soon engrossed in log-rolling, and quickly forgot the serpentine presence. A fine carab of the genus Leiadira, which my friend, Mr. T. G. Sloane, has been unable to identify for me, was the first catch of note, soon followed by the capture of a particularly large pair of *Pamborus viridis*, which caused us no little excitement. More weevils, staphylinids, and carabs were beaten from the vines, and from beneath a piece of bark I turned out a specimen of *Siagonyx Mastersi*, Macl.

Being by now very thirsty, the sight of the beautiful green foliage of a banana orchard proved attractive, but an investigation yielded nought but two tiny tomatoes, the banana trees being mostly in flower. Leaving the scrub again, we were amused by the antics of a small snake in its endeavours to get out of our path. A near-by orange orchard—the Blackalls are famed for their citrus orchards—with a wealth of golden fruit tempted us to break the fifteenth commandment. We yielded, and it was not long before we were contentedly sucking away at our ill-gotten gains. After I had thus despatched two, I

broke one open, and was horrified to find it contained a mass of maggots of the Queensland fruit-fly, Dacus, sp. We afterwards found out that practically the whole of the local crop was ruined by the ravages of this fly. Oranges, apparently without a blemish, were found to be full of the fruit-fly maggots, which, at the right time, eat their way out of the fruit and pupate in the ground. Some moss was collected from the trunk of a eucalypt, from which I later secured several small forms of beetle life, including a most interesting little weevil with enormously enlarged hind femora. The young eucalypts yielded several species of Chrysomelidæ, most of them belonging to that large genus Paropsis.

One morning I was attracted to an old stump by a loud buzzing noise, and expected to find it tenanted by bees. The noise was certainly hymenopterous, but emanated from a colony of wasps, that were densely clustered around a hole near the ground. Upon my attempting to bottle a specimen most of them retreated inside; but one crotchety member spitefully attacked me, and it required no little skill upon my part in wielding the net to save the day. One of the largest of the Adeliums—*A. striatum*, Pasc.—was frequently found under logs in the open spaces.

Upon two evenings we sallied into the scrub with a lantern, but the nights were unsuitable, and we secured but a few species of moths. A brightly luminous object, certainly much too large for the little phosphorescent malacoderms of the genus Luciola, was seen crossing the gully, floating high amongst the tree-tops. What it could be I cannot conjecture, unless some of our larger Elateridæ are capable of emitting luminosity.

We left Montville early one morning and travelled back to Palmwoods by the coach, and that coach ride will long remain impressed upon my memory. The road down the steep hills consists of a succession of S curves, so acutely formed that, should the horses get much out of a walk, it would be impossible to negotiate them. The curves are cut out of the hillsides, and are bounded on their outer edge by the most precipitous gullies. Our coachman was a grand old chap, but possessed of but a single eye, so that travelling these curves behind a four-in-hand was somewhat of a hair-raising experience. It was State election day, so a halt was made at the local State school whilst my companion exercised his privilege of franchise and I inspected the school museum, stowed away in sundry jam and pickle jars. One exhibit only aroused my cupidity, and that was a fine large specimen of *Batocera Boisduvalii*, Hope. We left our baggage at the Palmwoods hotel and set out along the little narrow-gauge railway line that leads to Mount Budderim. Some wattles yielded a couple of species of Belus,

and a little later I captured a specimen of that curious little carab, *Aerogenys hirsuta*, Macl. A very dainty little Cryptocephalus was taken on the wing, but diligent sweeping of the low herbage yielded nothing. Two examples of the butterfly *Tisiphone abeona Rawnsleyi*, Misk., were netted. This species is a form of our common Victorian Tisiphone, and is only found in a very limited area between the Blackalls and the coast. After travelling two or three miles along the line we came to a crossing over a small creek, and made this our headquarters for the rest of the day. The creek was an attraction to bird-life, and our camping spot evidently a favoured drinking place of the feathered community. A bevy of Red-browed Finches performed their ablutions without heeding our presence, and a confiding Yellow-breasted Robin reminded us of our Victorian fern-gullies. Black-faced and Leaden Fly-catchers, White-shafted Fantails, Harmonious Shrike-Thrushes, and Black-and-White Fantails all visited the creekside whilst we ate our dinner. On beating the foliage of a large shrub I was greatly surprised to find in my umbrella a number of the beautiful green staphylinids, *Stenus cœruleus*, Waterh., as the Victorian member of the genus, *Stenus cupripennis*, is always found sunning itself on the margins of pools and creeks. I also collected here some weevils, longicorns, and chrysomelids, the most interesting of the latter being a dainty little Aspidiomorpha, a study in green and gold. It is much to be regretted that so many of the Chrysomelids lose their brilliant colouring after death, this little sprite being now merely an opaque yellow hue. From beneath a log out in the open I disturbed a pair of the rather handsome *Notonomus nitidicollis*, Ch. Some long tussocks of sword-grass were cut off near the roots and broken up over our umbrellas. In this way we secured some elaterids, pselaphids, scydmænids, silphids, and also specimens of the red and black *Pæderus maculatus*, Macl. Earlier in the day, Mr. and Mrs. Bromwich, who lived adjacent, had kindly invited us to come and have afternoon tea with them; so we wended our way up a very pretty bush track to the homestead, a typical little Queensland home nestling amongst the gum-trees. Our host and hostess were interested in ornithology, and so a very pleasant hour or so was spent in their company. On the way back, in the twilight—which in Queensland is of very short duration—we collected some Nitidulidæ from a flowering spike of Xanthorrhœa, and also netted a couple of species of Heteronyx. We decided to make for Caboolture, so, collecting our traps, we started for the station to catch the evening train. Around the station lights there were swarms of the little *Aphodius granarius*, Linn., which apparently breeds very prolifically hereabouts.

Reaching Caboolture, we obtained lodgings at one of the local hotels, and, being very tired after our long day, retired early to rest. My companion was such an ardent entomologist, however, that I had barely fallen asleep before I was awakened to examine a very fine large hemipterous specimen that he had secured in his bed. In all, four specimens of this family, belonging to the genus Cimex, were taken, so that our night's rest was a very troubled one. Mr. Pottenger declared that other families of insects were also represented in his bed, but, being utterly worn out by now, I drowsily exclaimed, "Let 'em all bite."

Next morning we made north towards the picturesque Glasshouse Mountains, so called, I believe, by one of our early navigators, who saw in their acute peaks a resemblance to the bottle-shaped chimneys of a glass-manufacturing establishment. Near these mountains several returned soldiers have been settled on pineapple plantations. A nest of the ant *Iridomyrmex nitidus* yielded a staphylinid of the genus Dabra, all the species of which are myrmecophilous. The tea-tree, *Leptospermum flavescens*, was well in flower, and some Diphucephala and a longicorn of the genus Pterostenus were taken. Some very symmetrical white-barked eucalypts invited barking attentions, and rewarded our labours with *Adeltopus obscurus*, Cast., *Agonochila sublævis*, Ch., *Chalcopterus Arthuri*, Blackb., *C. cupripennis*, Hope, and *C. lævicollis*, Bless. A small pond was investigated with the net, and a rather fine dytiscid, with a white stripe near the outer edge of each elytron, was the principal find. Some more flowering tea-tree yielded some small Curculionidæ and a Microchætes. Banksia flowers (as they do in Victoria) gave us a nice little black-and-white weevil of the genus Cydmaea, and I noticed a form of tree locust that constructed for itself a kind of cocoon out of the velvety material that is attached to the core of dead banksia flowers. After securing a nice brenthid, we made our way back to the township, being driven in by the need of liquid refreshment. Later, we made another short excursion in a different direction, securing, amongst other things, a species of Læmosaccus and a nice Scaphid. Wishing to search for ant-nest beetles in a nest of the meat ant, I raked a considerable portion of one nest into my umbrella, and moved it from place to place until most of the ants had crawled off. My only find, however, was a single male of *Articerus Wilsoni*, Lea.

Another very pleasant excursion was made to Goodna, which lies out towards Ipswich. A couple of miles south of the station there is a small patch of the original scrub left, so we made our way towards this, following the sandy bed of a dry creek. The course of this creek was marked by a perfect

blaze of scarlet, as the Callistemons were in full flower. As we passed along we disturbed a Red-tipped Pardalote from her nesting-burrow, and were scolded by many Friar-birds who were feeding amongst the Callistemons. The scarlet flowers, whilst attractive to Hymenoptera, were sterile as far as Coleoptera were concerned. From beneath logs were obtained many specimens of the highly-glossed *Omolipus corvus*, Pasc., and a few examples of a very similar-looking tenebrionid, *Encyalesthus punctipennis*, Pasc. Another beetle that was extremely plentiful behind bark was the dumpy *Amarygmus convexus*, Macl. *Thallis Australiæ*, Lea, MSS., was located in a rotting Polyporus fungus, and I was extremely gratified to find a specimen of the ant nest histerrid, *Ectatommiphila opaca*, Lea. An old Hoop Pine log was attacked with a tomahawk, and a newly-emerged specimen of a handsome elaterid of the genus Alaus unfortunately damaged in the process. Mr. Illidge informs me that larvæ of members of this genus are predaceous, some of them specializing on certain longicorn larvæ. A Cudgerie log, on being split open, was found to contain larvæ and pupæ of a very large longicorn, and I have since been successful in rearing two of the pupæ, which proved to be *Agrianome spinicollis*, W. S. Macl. In this log I also found a few specimens of a very nice little Lemodes. In a dead twig of wood I discovered a perfect though dead specimen of the buprestid *Astræus Mastersi*, Macl. In the crevices of the bark of a large Bean-tree were taken a very quaint horned cryptorhynchid, *Glochinorrhinus Doubledayi*, Waterh. On either side of the rostrum, near the apex, there is a horn-like projection, the use of which it is difficult to conceive. A specimen of the rare March Fly, *Tabanus Davidsoni*, was obtained from the trunk of a tree, and from the foliage of a small wattle hundreds of specimens of a small weevil, *Titinia ignaria*, Pasc. I was attracted to the wattle by its moribund appearance, wondering if some borer had attacked its roots. However, the weevils were responsible, as they had devoured the outer skins of nearly every leaf of the tree. A large Xantholinus, probably *lorquoni*, Fvl., was turned out from beneath a log. It is very like our common Victorian *X. phœnicopterus*, Er., so frequently found in Melbourne gardens. Near here I was fortunate in locating a nice little chrysomelid, which I have since named *Oomela bicolor* (MSS.) Some bovine remains were judiciously turned over, and rewarded us with two species of Trox, two of the introduced Necrobia, and a particularly large specimen of the silphid, *Necrodes osculans*, Vigors.

Perhaps one of the most interesting beetles secured was the fine large anthribid, *Ancylotropis Waterhousei*, Jek., with its tapir-like snout and long, thin antennæ—much longer than

the beetle itself. Four of them were resting on the limbs of a dead wattle, from which I have no doubt they had recently emerged. Another particularly interesting little beetle, two pairs of which fell to my lot, was a scydmænid, with wonderfully abnormal antennæ. In the sandy bed of the dry creek were obtained numerous examples of *Hyocis pubescens*, Macl., besides many of an anthicid of the genus Mecynotarsus. Another afternoon was spent collecting around Mount Coot-tha, which, the guide-book tells us, signified in the aboriginal tongue "honey." In a gully I found a single example of a Tachys, which Mr. Sloane considers a particularly interesting one, and which he has named after me. The principal finds around the mount were *Pterohelæus cornutus*, Macl., *P. piceus*, Kirby, *Cardiothorax errans*, Pasc., *Adelium porcatum*, Fab., *Metoponcus cyaneipennis*, Macl., and one of the very rare Lymexylonidæ.

On the way home a few days were spent in Sydney, and the opportunity thus afforded taken of visiting the well-known entomologists, Messrs. H. J. Carter and Dr. E. W. Ferguson, with each of whom I spent a very pleasant and interesting evening. Mr. Carter's wonderful collection of Buprestidæ and Tenebrionidæ are an eye-opener, and to view Dr. Ferguson's unique collection of amycterids was a treat indeed. A visit was also paid to the Australian Museum, where I met Mr. Musgrave, the newly-appointed entomologist, who kindly showed me some of the Macleay and King types that are housed in that institution. Two short, though pleasant, collecting trips were taken to Narrabeen and National Park. At the latter place I was pleased to take three species of Chlamydopsis, one specimen of Serricollis, Lea, two of Excavata, Lea, and six (all in one nest) of Epipleuralis, Lea. From Narrabeen I brought home a small limb of a dead Casuarina, from which I later bred out several specimens of the common weevil, *Orthorrhinus cylindrirostris*, Pasc.

This concluded my collecting experiences for the trip, and there only remained the somewhat tedious task of mounting all my captures. In all, several hundreds of specimens were brought home, representing Coleoptera, Lepidoptera, Forficulidæ, Blattidæ, Diptera, Hymenoptera, and Termites. So far three new species of beetles have been named as a result of the trip, and there will probably be several more when all the material has been fully dealt with.

[NOTE.—The following corrections should be made in the first portion of this paper:—Page 55, line 16, for "H. S." Pottenger read "H. L." Page 56, line 31, for "*Velova*" read "*Velora*," and in line 37 for "Gary" read "Gory."]

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The Victorian Naturalist:

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— OF —

The Field Naturalists' Club of Victoria.

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The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	71
Notes	74
The Gippsland Lakes Country: Physiographical Features. By T. S. Hart, M.A.	75

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Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 12th DECEMBER, 1921.

1. Correspondence and Reports.

2. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

3. General Business.

4. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for examination of Exhibits.

5. Reading of Papers and Discussion thereon.

   1. By Mr. A. J. Tadgell—"A Further Contribution to the Alpine Flora of Victoria."
   2. By Mr. C. J. Cole (communicated by Mr. C. French, jun.)—"Notes on the Caper Butterfly."

6. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

7. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICE.

Subscriptions for 1921–22 are now due. Early payment will be greatly appreciated by the Hon. Treasurer and Committee.

Any change of address should be notified to the Hon. Secretary at once.

The January meeting will be held on the **third** Monday—16th January, 1922.

The Victorian Naturalist.

Vol. XXXVIII.—No. 8. DECEMBER 8, 1921. No. 456.

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 14th November, 1921.

The president, Mr. F. Chapman, A.L.S., occupied the chair, and about fifty members and visitors were present.

REPORTS.

A report of the excursion to Paradise (lately renamed Clematis), on the Gembrook line, on Saturday, 15th October, was forwarded by the leader, Mr. J. W. Andas, F.L.S., who reported a good attendance of members. The party walked along the line towards Emerald, then, turning northwards, descended into the valley of the Menzies Creek, and traversed the tourist track, which abounds in vegetation of all kinds, and affords many delightful vistas. The track was followed back to Paradise, where the evening train to town was taken. While a large number of plants and shrubs were noted in bloom, none of the species was of great rarity.

A report of the excursion to Eltham on Saturday, 22nd October, was given by the leader, Mr. E. S. Anthony, who said that the outing had been well attended. The party was met by his co-leader, Mr. W. Tonge, and, favoured by a beautiful afternoon, an enjoyable ramble resulted. The object of the excursion was to see the birds nesting, and, owing to Mr. Tonge's knowledge of the locality, the nests of numerous birds were pointed out, and remarks as to their peculiarities made the ramble most instructive. Afternoon tea was kindly provided by Mrs. Tonge, and all returned to town well satisfied with the outing.

On the motion of Messrs. F. G. A. Barnard and H. B. Williamson, a hearty vote of thanks was directed to be conveyed to Mr. and Mrs. Tonge for their hospitality.

A report of the excursion to Healesville on Saturday, 29th October, was, in the absence of the leader, Mr. E. E. Pescott, F.L.S., given by Mr. H. B. Williamson, who said the excursion had been arranged principally for the collection and study of orchids, and of these some twenty-five species were seen or collected. The Giant Moss, *Dawsonia superba*, was found in luxuriant growth at Condon's Gully, where also the orchid *Chiloglottis Muelleri* was noted on the tree-fern trunks; among the other orchids seen were *Diuris punctata* and *Pterostylis furcata*. The party was greatly indebted to Mrs. Coleman, of Healesville, for afternoon tea and for the inspection of her garden, in which a number of our native orchids are being cultivated.

On the motion of Messrs. Williamson and Barnard, a vote of thanks to Mrs. Coleman was carried unanimously.

A report of the excursion to the You Yangs on Cup Day (Tuesday, 1st November) was given by the leader, Mr. C. Daley, F.L.S. The day turned out rather warm, and the five-mile walk to the hills was found rather trying. A visit was paid to the forestry plantation on the western side of the range, where Sugar Gums and the Canary Island Pine were seen to be doing very well. The Snowy Prostanthera, *P. nivea*, one of the characteristic shrubs of the district, was found to be in fine bloom, as also the Late Black Wattle, *Acacia mollissima*, but the range does not possess a very extensive flora. Owing to the heat, few birds of any importance were noted. Mr. L. Thorn, who devoted himself to Lepidoptera, noted eight species of butterflies, securing pupæ of the Scarce Mistletoe Blue, *Orgyris abrota*, and of the Mistletoe Blue, *O. olane*. Among the butterflies taken were the Lesser Wanderer, the Wood White, *Delias aganippe*, the Little Copper, *Lucia lucanus*, and the Caper White, *Anaphaeis java teutonia*. Several larvæ of the Australian Admiral, *Pyrameis itea*, were found feeding on the nettles. Mr. C. Oke secured thirty-seven species of Coleoptera, several of which are peculiar to the district.

A report of the excursion to Grice's Creek, *via* Frankston, on Saturday, 12th November, was given by the leader, Mr. F. Chapman, A.L.S., who reported an interesting day. The locality is interesting both physiographically and palæontologically, and on this occasion yielded a fine variety of specimens.

ELECTION OF MEMBERS.

On a ballot being taken, Miss Margaret Guerin, West Bourke Hotel, Queen-street, Melbourne; Mr. E. O. Boase, Ivanhoe; Mr. Arthur Jones, 116 Eglinton-street, Kew; and Mr. A. E. Rodda, Norwood-avenue, Brighton, were duly elected as ordinary members; and Mr. H. M. Collins, "Gracehill," Frankston, as a country member of the Club.

GENERAL BUSINESS.

On the motion of Mr. F. Pitcher, a letter of condolence and sympathy was directed to be sent to Mrs. Drake, of Upper Beaconsfield, on the death of her husband, Dr. Drake, a country member of the Club, to whom the members had been indebted for hospitality more than once when visiting the district.

REMARKS ON EXHIBIT.

Mr. F. G. A. Barnard called attention to an exhibit of a specimen of a European edible frog, *Rana esculenta*, preserved by a special process by Mr. D. M'Alpine, a former member of the Club, when a biological lecturer in Edinburgh, in October, 1881, where it had been used for teaching purposes. A paper

describing the process was read by Mr. M'Alpine before the Club in April, 1886 (*Vict. Nat.*, June, 1886, iii., p. 14), when the same specimen was exhibited. It seemed none the worse for its forty years' wear and tear; this, he thought, was sufficient proof of the value of Mr. M'Alpine's process, which was not at all difficult to carry out.

PAPER READ.

By Mr. H. B. Williamson, entitled "Notes from the Mallee: Botany."

The author, by means of lantern slides, described the principal features of the vegetation in the northern Mallee around Ouyen, Walpeup, Murrayville, and Lake Hattah, also views taken recently of the country between Ultima, Manangatang, Cocamba, and Ouyen. Several of the flowers illustrated seemed worthy of introduction into our gardens, and dried specimens of the more notable species were exhibited.

NATURAL HISTORY NOTE.

Mr. F. G. A. Barnard stated that when passing along the Donnabuang track, between Panton's and the head of the Don, on 30th October, he saw a specimen of the scarce butterfly, *Papilio sthenelus*. The specimen was in good condition, indicating that it must have been bred in the district, which is about 2,000 feet above sea-level. He also mentioned, as a caution to intending tourists, that the track from Millgrove, on the Warburton line, to Ben Cairn Rock is so overgrown and obstructed by fallen timber as to be quite impassable.

EXHIBITS.

By Mr. E. S. Anthony, on behalf of Mr. W. Tonge.—Twelve water-colour drawings of Victorian birds frequenting Eltham district.

By Mr. F. G. A. Barnard.—Specimen of a frog preserved by Mr. D. M'Alpin by a simple process of drying in October, 1881.

By Mr. F. Cudmore.—Three cases of Balcombian fossils from Grice's Creek, near Mornington; also case of fossil shells of Upper Cretaceous age replaced by precious opal, from Stuart Range, Central Australia.

By Mr. F. Chapman.—Fossils from Grice's Creek, near Mornington; and, on behalf of National Museum, Cyprid limestone, from Bennett's Tank, near the South Australian border, Mallee, Victoria.

By Mr. M. Moodie.—Geological specimens.

By Miss G. Nokes.—Flowers from Upper Yarra.

By Mr. C. Oke.—Thirty-seven species of Coleoptera from You Yangs excursion, including *Ectatommiphila opaca*, Lea.

By Mr. L. Thorn.—Larvæ and perfect insects of three gum moths—*Nola lugens*, *Œnosanda Boisduvalli*, and *Trichetra mesomelas*.

By Mr. J. R. Tovey, on behalf of the National Herbarium.—Dried specimens of *Aponogeton distachyum*, Thunb., "Cape Pond Lily" (Naiadaceæ), collected at Stony Creek, Lorne, Victoria, by Rev. A. C. F. Gates (not previously recorded as growing wild in Victoria); *Luzula campestris*, D. C., var *australasica*, Buch. (syn. *L. Oldfieldii*, Hook f.) (Juncaceæ), from Bennison's Plain, Gippsland, collected by A. W. Howitt, 1887, Hawkesdale, H. B. Williamson, May, 1899, and Lorne, A. C. F. Gates, November, 1921 (this variety is a native of New South Wales and Tasmania, but has not been previously recorded for Victoria); *Zieria aspalathoides*, A. Cunn., "Hairy Zieria," from Mount Tarrengower (about 1,300 feet), Maldon, Victoria, collected by Rev. W. C. Tippett, October, 1921 (this species has only been recorded from two localities in Victoria—viz., barren ridges near Goulburn River, F. Mueller, and the Grampians, A. Cunningham: the latter specimen is not represented in the National Herbarium).

By Mr. H. B. Williamson.—Dried specimens of wild-flowers from the Mallee, including Asters, Halganias, &c., referred to in his illustrated paper:—*Olearia magniflora*, *O. rudis*, *O. pimelioides*, *Halgania lavandulacea*, *H. cyanea*, *Kochia villosa*, *K. triptera*, &c.

After the usual conversazione the meeting terminated.

Donation to the National Museum.—A valuable collection of Australian Lepidoptera, belonging to the late Dr. W. Elliott Drake, M.A., of Upper Beaconsfield, for many years a member of the Field Naturalists' Club, has recently been presented to the National Museum by Mrs. Drake. The collection, which is in an excellent state of preservation, and carefully labelled, comprises over 5,800 specimens, the great majority of which were collected by Dr. and Mrs. Drake, chiefly at Upper Beaconsfield and Black Rock. It includes the types of a number of new species not previously represented in the Museum collection, and many others which, with the spread of population and the destruction of their natural surroundings, have become rare and difficult to secure.

"Journal of Agriculture of Victoria."—The November issue of this publication contains several articles of more than passing interest to naturalists. Dr. Cherry continues his paper on "The Discovery of Agriculture." An article on "The True Clovers Naturalized in Victoria," by Mr. J. W. Audas, F.L.S., of the National Herbarium, contains, besides an enumeration of the species, a deal of valuable information in a handy form; while Mr. H. W. Davey, F.E.S., gives the first portion of what should be a very useful article on "Weeds and Their Eradication."

THE GIPPSLAND LAKES COUNTRY: PHYSIOGRAPHICAL FEATURES.

By T. S. Hart, M.A.

(With plate.)

(*Read before the Field Naturalists' Club of Victoria, 8th August*, 1921.)

In 1914 the late Dr. T. S. Hall contributed to the Field Naturalists' Club a short sketch of the Gippsland Lakes (*Vict. Nat.*, xxxi., p. 31, with map), based, as he says, on two short visits. Having resided in the district for some time, I would desire to supplement that description and to deal with some points which he left open or had no opportunity of observing. If in certain matters I modify the view taken by him, I do so with full appreciation of much kindly assistance received from him in the past, and with the knowledge that he also would have welcomed further information.

My observations are made from Bairnsdale as a base, and are necessarily fuller as regards that part of the district. Lake Wellington and the head of Lake Victoria I have not yet visited. The older formations lying to the north of the Gippsland Plains include rocks of a variety of ages, dealt with, for instance, in various papers of Dr. Howitt's. For the present purpose it is only necessary to note that they had been planed down to a surface of low relief near the commencement of Tertiary time, and again trenched by steep-sided valleys after elevatory movements.

Tertiary Country.—The lower hills and the plains of Tertiary age are best understood by dividing that time into three parts —a period of deposition, a period of elevation and denudation, and a period of coastal submergence and subsequent modification, including further denudation and new formations.

Deposition of the Tertiaries.—On a surface already of low relief and undergoing deformation, there accumulated the Janjukian series, including both mechanical sediments and limestones. The brown coals further west are no doubt also related to the low relief, for such a surface would allow ready establishment of swampy conditions, especially with slight alterations of shape. Greater deformations allow the great thickness of the brown coals and of the Tertiary series as a whole. The Janjukian series was followed by the Kalimnan marls and other sediments, with which it is convenient for the present purpose to include as a later stage the great accumulation of non-fossiliferous sands, gravels, and clays which follow, just as we can group the yellow sands of Brighton with the fossiliferous rocks below them. These upper beds are predominantly sandy, and usually of little power to resist denudation. The limestones are stronger.

Denudational Phase of the Late Tertiary.—The present sur-

face forms in the Tertiary area show a succession of terraces, the upper ones cut through by the lateral valleys. As change in relative levels of land and sea took place, the land gradually emerging, the weak strata would be exposed to the attack of the waves, and would be partially removed (just as at Beaumaris the upper beds of the Tertiary series are lost—no doubt by marine denudation during emergence).

The higher terraces may be largely due to this action, but with each stage of the elevation of the land the stream would rapidly cut down to base level and widen their plains, and the lower terraces of the Mitchell are clearly related to the existing valley. The terracing is well seen about Bairnsdale, and is substantially indicated in Murray's map of Gippsland (sheet 1) by successively newer Tertiary areas at lower levels along the Latrobe. On the higher terraces north and north-east of Bairnsdale there are quartz gravels of moderate-sized pebbles with a good proportion of smaller material, forming good road gravel, as it sets well. These occur at different levels, and I incline to regard them as concentrates of the coarser material of the Tertiary beds during the formation of these terraces.

The lower terraces are characterized by the presence of a very heavy gravel, aptly called "torrent gravels" by Chapman, who urges their fluviatile character—a conclusion which their whole relation to the valleys amply supports. About Bairnsdale they occur to about 140 feet above sea-level, but up-stream they are found higher, as, for instance, near Lindenow station. The railway follows one of these terraces from Hillside (146 feet) to near Bairnsdale.

The torrent gravels are traceable south of Bairnsdale past Eagle Point, where they form the top of the cliff, and across Newlands Backwater as far as Tom Roberts's Creek, on Lake Victoria. A well-marked lower terrace forms the greater part of Bairnsdale township and the south of the parish of Broadlands. Bairnsdale station is 46 feet, and Nicholson station 48 feet above sea-level. In the Mitchell valley the torrent gravels consist of rocks which are likely to be found higher up the present valley—Devonian sandstones, porphyries, bedrock sandstones, and quartz. Weak and decomposable rocks are few, and the pebbles are well rounded. Silicified wood fragments are occasionally found, and have been derived from older formations—having been silicified before inclusion in the torrent gravels. The Bairnsdale School of Mines has also silicified wood from the Dargo High Plains, which gives a source, no doubt, in association with the volcanic rocks and within the present Mitchell catchment.

The discrepancy between Dr. Hall's determination of the gravels generally as Kalimnan and Mr. Chapman's placing of

the torrent gravels as Werikooian is due to the fact that the observations are on different gravels. Dr. Hall observed the gravels of the Kalimnan series at the Cunninghame Red Bluff, and pebbles occur here also in a bed largely composed of fossil casts above the Arachnoides bed mentioned by Hall. He would have seen the torrent gravels at Eagle Point from the boat: but, though the erosion of the underlying beds is evident, it is not more than could occur during the deposition of one series if a strong current flowed over sand just deposited. It is not evident from this section alone that the torrent gravels are a distinct series, but it is undoubted on a wide view of their occurrence and their relation to the land forms. There are gravels of the earlier accumulatory phase of the Tertiaries, as at Red Bluff and elsewhere, but the torrent gravels are distinct. They are little seen on the Bruthen road, which Dr. Hall traversed, and in passing through them in the train their real relation to the country is not easily seen.

As the main valleys cut deeper, there were left higher-level Tertiary areas between them. Thus, between the Avon and the Mitchell the railway passes over such an area (248 feet at Munro, 272 feet at Fernbank), and through this runs the intermittent stream of Providence Ponds (or the Perry River). In spite of the elevation above the main valleys and Providence Ponds, this area contains numerous swampy flats. The higher-level Tertiaries also occur between the Mitchell and Nicholson and between the Nicholson and Tambo, and beyond the Tambo reach to near the coast. They also flank the higher hills to the north. They are usually well drained, commonly carrying sandy soils, and are forest country naturally with much undergrowth. Parts are now orchards and cultivation land.

The Bengworden road, south-west from Bairnsdale, starting on a torrent gravel area, rises to a higher but similar terrace and then over a projecting tip of the higher-level sandy Tertiaries south-west of the main valley of the Mitchell; then it crosses a plain which continues to near Lake Victoria, and meets the torrent gravel area on the east. This plain is not clearly referable to any of the main valleys, and appears likely to be a marine plain dating from the emergence of this part of the land. It carries many swampy areas, its drainage system not being yet well developed. Across it is the route of the old "Commissioner's Road"—a track from Alberton to Eagle Point, where Tyers had a residence. Portions of this road are still in use. A route from Sale to Bairnsdale *via* Clydebank and Bengworden will soon be available.

It is difficult to say how far gravels may occur under this plain, as natural and artificial sections are rare. Part of it has a clay subsoil, and clay subsoil is also characteristic over the torrent gravel on the plain west of Bairnsdale. Water-

holes are kept shallow both for ease in making and because of the good holding clay. On the edge of the plain, however, near Lake Victoria, the torrent gravels are conspicuous east of Tom Roberts's Creek. There are some finer gravels further west, but I think a marine plain of denudation is most likely. The torrent-gravel terraces and the parts of this plain with clay subsoil are commonly grass land, with scattered trees—Red Gum, Casuarina, &c.—the typical open Gippsland plains. By this series of elevatory movements the land reached a higher level above the sea than now. The valleys again deepened, but, being partly in limestones, the erosion was less easy than in the sands, and these parts of the valleys would be narrower and probably more irregular.

Within the limestone area, as noticed by Clark and Dennant, there are numerous depressed areas, which are no doubt due to collapse over solution cavities in the limestone, the formation of which would be easier at this period of deep valleys. They are seen at many places on the terraces, where, commonly, the limestone is not the surface rock, but occurs below. Some are seen close west of Hillside, on the railway, and others in the Botanical Reserve and the Racecourse Reserve at Bairnsdale. Some of these hollows hold water, some not, according to whether impermeable material occurs in them or not.

The Coastal Submergence.—Coastal submergence then caused the lower parts of the valleys to be placed below sea-level, producing the characteristic deep inlets. Lake Tyers, Lake Bunga (east of Lakes' Entrance), and the North Arm at Lakes' Entrance are mentioned by Dr. Hall as "drowned valleys," but the feature is much more widespread. There are numerous inlets from the Lakes between Kalimna and Metung which are smaller drowned valleys, as well as Newlands Backwater (the estuary of Forge Creek) and Tom Roberts's Creek, at Lake Victoria. Both Hall and Chapman mention the deep silted-up valleys of the Mitchell, Nicholson, and Tambo—valleys whose beds are well below sea-level. It is clear that if the silt could be supposed removed these would be typical drowned valleys of the Lake Tyers type. The three larger rivers have silted up the sunk valleys; the Mississippi Creek and Boggy Creek, flowing into the North Arm and Lake Tyers, but not heading far back, have not been able to do so.

The Mitchell at Bairnsdale, then, being a silted-up, drowned valley, it follows that Lake King, intervening between it and the coast, is the lower part of the combined valleys of the Mitchell, Nicholson, and Tambo. But before drowning it was a valley of a different type, partly as the lowest and earliest-matured part of the valleys, but especially because it is outside the area in which limestones occur at the surface, and widening of the valley is easier. Without any close acquaintance with

Lake Wellington, it seems inevitable to regard it in the same way as the lower valley or plain of the combined Avon and Latrobe, with, of course, the Macalister and Thomson, which have joined the Latrobe above the lake. The difference is not that these lakes are not drowned valleys, but that they are drowned valleys of a different form.

Eastward from Lake Tyers is the long stretch of Ewing's Marsh, with arms extending inland, outlined on maps and suggestive of the Lake Tyers type; and, though I have not been able to visit this area, I am informed that there are limestone banks at some of the edges of the marshlands.

Lake Victoria and the Outer Parts of the Lakes.—The submergence exposed fresh areas to the immediate attack of the waves, and these consisted of feebly-resisting materials. Any sand-hills of the coast immediately before the submergence would be lost, though possibly some older ones further inland might survive. The older dunes, as seen at Sorrento, do not appear to be anywhere mentioned east of Corner Inlet. The cliffs from Cunninghame Red Bluff to Tambo Bluff inside the outer lakes are, then, sea cliffs, as are also the steep banks from Paynesville south-westward inside Lake Victoria and north-westward from Paynesville to Bairnsdale, though these last would be less exposed, and the steepness of some near Bairnsdale may be helped by the fact that there are springs at their base. The present steep cliff at Eagle Point is, however, clearly due to the attack of the river, which here meets the higher land. Sperm Whale Head, south of Lake Victoria, would, then, probably be either an island on the coastal shelf or the end of a promontory—most likely an island, as the natural outlet of the Latrobe would seem to be further west. Such would agree with Hall's observation that at first he was sure that Sperm Whale Head was part of the Tertiary plateau, but further east was dune. I regret that I have not yet been able to visit this area at the head of Lake Victoria. Where the cliffs were capped by torrent gravel, shingle would remain on this coastal shelf.

The Ocean Barrier, or Hummocks.—On the outer edge of this shelf, probably with the help of decrease of depth of water (due to a change in relative level of land and sea, as suggested by Sir Edgeworth David), there accumulated the sand dunes, thus cutting off the gulfs and inner part of the shelf from the sea, and completing the formation of the Lakes. The long stretch of shallow water known as Lake Reeves (parts of which may be dry) is a simple lagoon behind the hummocks.

This sand drift operated outside the line of cliffs, and is not the cause of all the eastward element in the courses of the streams. The Latrobe has a remarkably direct eastward direction from the Moe River Heads to Lake Wellington, as was

noticed by Tyers in 1844, but this is a little obscured by using the name Latrobe for one of the northern heads. South of Trafalgar the sharp rise of the high land is no doubt a fault-scarp, which probably extends into the heads of the Lang Lang also. Further east an old trough is commonly accepted about Morwell, and later movement on the same fault lines would account for the direct course of the Latrobe. The divide south of the Latrobe is called a range by Murray to a point between Lake Wellington and the sea.

The combined valleys of the Latrobe and Avon, with, of course, the Thomson and Macalister already joined to the Latrobe, and Providence Ponds to the Avon, reaching the old coast-line somewhere east of Dutson, may have been deflected north-easterly by the sand-drift and continued along the coastal shelf in what now makes Lake Victoria. In the same way the combined Mitchell, Nicholson, and Tambo valleys, reaching the old coast between Paynesville and Tambo Bluff, have been deflected eastward also along the coastal shelf to the vicinity of the Cunninghame Red Bluff. Here the sand-hills meet the old sea-cliff, and further deflection is blocked. The natural entrance to the Lakes seems to have varied in position in this vicinity. Further east, before Lake Tyers, there is again a line of sand-hills close in front of the cliff. Beyond Lake Tyers the hummocks close the direct mouths of several other streams and affect the mouth of the Snowy River. Lake Victoria and Reeves's River have thus a special character of their own : the main channel of the deflected stream along the coastal shelf.

The idea of a slight emergence of the land, which would evidently facilitate the formation of the hummocks, is also supported by the low plain of Goon Nure, inside Lake Victoria, which may well be regarded as a wave-cut shelf raised a little above water level, on which plain have accumulated sand-hills, part at least wind-driven, marsh deposits, and some sand carried down by a creek which runs then through a series of swamps to Bland Bay (Lake Victoria), though it is said in heavy rains to overflow also by another route. A fine shingle is seen on this plain at Storm Point, which could have been derived from the ordinary Tertiaries without the torrent gravels, which do not reach so far. It is, then, natural to group with this low plain Banksia Peninsula (further north-east) and Raymond Island, both low and sandy, with some heavier shingles on the beach, for the cliff behind Banksia Peninsula is capped with torrent gravels. Both these low areas may rest on shoals carrying pebbles from the heavy gravels, though it is possible also that Raymond Island might be a fragment of the lower terrace of Bairnsdale and Broadlands. The low land near Paynesville also admits both these explanations.

There is also low land on the north side of the main channel of the Lakes, at Metung and Nungurner. Opposite Metung is a considerable area of low land connected to the coastal hummocks, and a series of low islands and shoals stretch from Rotuma Island, close to Sperm Whale Head, to the Lakes' Entrance township, itself a low promontory. Some of these may have been formed as accumulations in swamps behind the sand-hills, very like the position of Lake Reeves to-day, and on these more or less drifted sand would pile up. At present the alteration of currents due to the new entrance is cutting away some parts but allowing shoaling, and, indeed, actual filling, east of Lakes' Entrance. No doubt in the past changes in the entrance modified these low lands, and especially would this be the case if an entrance towards Ocean Grange had been blocked and all the western waters sent to Cunninghame. At present wave-action is also affecting the lake shores. It is common to find a shallow water ledge, and the dark soil of Melalcuca flats is seen at places being cut away by the lake.

In the quieter backwaters mud is accumulating, and the visitor needs to proceed with care. Landing in a little creek off Bancroft Bay, our boat had apparently touched bottom, but an oar could be thrust down nearly full length in the mud. You cannot stand on this or swim in it, and a boat stuck in it may be hard to get off. It is well to be careful in recovering a duck, for instance. Jones's Bay, near Bairnsdale, is well known as having a treacherous bottom. Two other dangers are notified to visitors to the Entrance—the ebb tide, which may run seven knots, and the rapidity with which the sea outside can rise sufficient to swamp an open boat.

Among other processes going on in the Lakes is the formation of land with the help of shallow water vegetation—the "rand" formation mentioned by Gregory—as is very likely happening in Jones's Bay. The long silt jetties of the Mitchell are well known, running out as narrow tongues into the Lake for four miles below Eagle Point. These tongues are only the visible top edge of the silt, the little step down on the lake side being due to waves. One of these was cut through in a recent flood. Above Eagle Point the Mitchell silt has cut off a westward bay of the lake, impounding the waters of Cobbler's Creek and forming M'Leod's Morass. Part of this is undrainable, being below lake level; the remainder is liable to flood both from its own catchment and the overflow of the Mitchell. In addition, soluble salts—partly, at least, magnesian—in the soil appear as a white efflorescence in summer, and cause decay of wire-netting in the fences. The little valley of Tyers Creek, at Eagle Point, has also been closed by the Mitchell silt. The Mitchell silt jetties, though indicated by shoal beyond the present mouth, will be hindered from extending to the opposite shore, or prevented, by the necessity for an outlet

for the Nicholson waters. The Tambo has smaller silt jetties. Salt marsh now occurs at many places, as on the shores of Jones's Bay, at Eagle Point Park, at Paynesville, and at Lakes' Entrance township.

Both in the Nicholson River flats, at Sarsfield, and in Clifton Morass, north of Bairnsdale, there occur sulphurous springs. Marcasite, the easily decomposing form of iron sulphide, occurs at Sarsfield, and some drains show barren black banks, as organic matter is abundant in the soil: but the acid waters stop vegetable growth. Yellow patches on this black ground are locally called sulphur, but are really a sulphate of iron (copiapite): a whitish deposit on twigs or other objects in the water is really sulphur. Marsh gas and sulphuretted hydrogen are probably both present.

An explanation may be given for "Mt. Cunninghame," mentioned by Dr. Hall as probably the lowest mount in Victoria, the whole country being not more than 20 feet above sea-level. It is merely a name for a survey station. A main survey line from Mount Taylor to Seacombe trig. station passes over a low hill named as Mount Wrixondale, north of the Lakes, and on the Wrixondale–Seacombe line are formed two triangles—one with its apex at Stockyard Hill, in the coastal hummocks, and the other at "Mount Cunninghame," near Lake Wellington.

Conversations at Lakes' Entrance suggest that there may be room for interesting observations in the changes of the lake fauna, and possibly also water plants, as a consequence of the permanently open entrance. The variety of different types of country on land presents an interesting field for botanical observations, and no doubt also zoological.

I am indebted to Mr. H. D. Bulmer, of Bairnsdale, for the two interesting views reproduced herewith. These were taken from an aeroplane, and graphically illustrate the singular physiographical feature of the eastern portion of the lakes area.

[The paper was well illustrated by maps and photographs of the different features.—ED. *Vict. Nat.*]

EXPLANATION OF PLATE.

FIGURE 1.—AERIAL VIEW FROM LAKES' ENTRANCE.

Township in the foreground, looking westward up the Lakes. The North Arm appears to the right of the township, with Jemmy's Point behind it. The main channel, or Reeves's River, is close behind this Point and along the right side of the view close up to the cliffs. The low islands are Rigby, Fraser, and Flannagan Islands, the low land opposite Metung beyond them. To the left, in the distance, is the beginning of the long lagoons behind the coastal hummocks.

FIGURE 2. THE SILT JETTIES OF THE MITCHELL RIVER MOUTH.

Jones's Bay on the left; Eagle Point Bay on the right. The land beyond comprises the low country between the Nicholson and Tambo Rivers. Eagle Point is a prominent cliff on the Mitchell, six miles below Bairnsdale. Eagle Point Bay is on the other side of the park there, and does not connect with the river till the end of the silt jetties.

PLATE III.

FIG 1.—AERIAL VIEW—LAKES' ENTRANCE AND LAKES.

FIG. 2.—MITCHELL RIVER FROM THE AIR.

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The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	83
Excursion to Bendigo	86
Excursion to Eltham	88
Excursion to Frankston	91
A Day's Beetle-Collecting at the Lerderderg. By Charles Oke	93
Notes on Mueller's Literary Work. By E. E. Pescott, F.L.S.	98
Notes	97, 102

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Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 16th JANUARY, 1922.

1. Correspondence and Reports.

2. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

3. General Business.

4. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for examination of Exhibits.

5. Reading of Papers and Discussion thereon.

   1. By Mr. F. Chapman, A.L.S.—"Notes on the Geology of the Mallee" (illustrated by lantern views).

6. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

7. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICE.

Subscriptions for 1921–22 are now due. Early payment will be greatly appreciated by the Hon. Treasurer and Committee.

Any change of address should be notified to the Hon. Secretary at once.

The Victorian Naturalist.

Vol. XXXVIII.—No. 9. JANUARY 12, 1922. No. 457.

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th December, 1921.

In the absence of the president, Mr. F. Chapman, A.L.S., through illness, the chair was occupied by Mr. C. Daley, B.A., F.L.S., one of the vice-presidents, and about fifty members and visitors were present.

CORRESPONDENCE.

From the Secretary for Lands, stating that, in response to the Club's request, certain portions of Crown lands on the banks of the Menzies Creek, near Emerald, as defined in the *Gazette* notice of 19th October, 1920, had been reserved for recreation purposes.

REPORTS.

A report of the excursion to Tooradin, Western Port, on Saturday, 19th November, was given by the leader, Mr. H. B. Williamson, who said that, though the party was not large, the members taking part in the excursion had a pleasant and interesting outing. One of the so-called Native Cherries, *Exocarpos stricta*, the Pale-fruited Ballart, was noticeable on account of the heliotrope succulent stems of the seeds, usually regarded as the fruit. These were tasted and found to be very similar to the corresponding part of the common Cherry Ballart. The Purple Fringed Lily, *Thysanotus tuberosus*, was numerous along the roadside, while the Golden Spray, *Viminaria denudata*, was quite a prominent feature of the district. Near the township was a tidal creek fringed with mangroves. These trees, with their curious breathing roots, were investigated, and were found to be bearing well-developed fruits resembling broad beans. Just above the mangrove areas, on which no other form of plant life grows, were a number of salt-loving plants, such as the Common Sea-blite, *Suæda maritima*, Swamp Saltbush, *Atriplex paludosum*, and the Creeping Brookweed, *Samolus repens*, with its pretty white flowers. Several rarer plants were noticed here, such as the Sea Lavender, *Statice taxanthema*, Salt Plagianth, *Plagianthus spicatus*, and the Narrow-leaved Wilsonia, *W. Backhousii*. Plants of the trailing Jointweed, *Hemichroia pentandra*, were found affected with a rust (fungus), and were forwarded to Mr. Brittlebank for identification. An invitation to lunch with Mr. Edgerton, an old resident of the district, was accepted, and in the afternoon he intended to pilot us through some

scrub where other plants might have been found, but, rain setting in, this portion of the outing had to be abandoned. Some Black Wattles were pointed out to us which were bearing well-developed pods, which were said to have begun to form in July last, but the trees did not bloom till a few weeks before. On the motion of Messrs. Barnard and Williamson, a vote of thanks was directed to be sent to Mr. and Mrs. Edgerton for their hospitality to the party.

In the absence of the leader, Dr. G. Horne, V.D., a report of the excursion to Altona Bay on Saturday, 26th November, was given by Mr. C. Daley, F.L.S., who said that the party had a very interesting outing. Numerous sites of aboriginal camps were seen, and chips and cutting stones of various kinds were found.

A report of the excursion to Warragul on Saturday, 10th December, was given by the leader, Mr. H. B. Williamson, who said that, owing to an invitation from our co-members, the Misses Currie, of Lardner, about five miles south-west of Warragul, which, however, is easier reached from Drouin, the party returned to that station, and drove out part of the way to Lardner. Then, following a pretty bush road lined with flowering shrubs of various kinds, in due time reached the Currie homestead, in the vicinity of which the rest of the day was spent, walking back to Drouin in the evening. In the garden attached to the house numerous native shrubs and trees were found to be doing remarkably well, also several notable exotic trees. These are the haunts of numerous birds, which are carefully protected, and add interest to the garden. A walk round the farm showed that thoughtful and effective tree-planting has been done. Thus, clumps of tree-ferns left when clearing have been protected by shady trees being planted near them. The caterpillar pest was in evidence in several of the paddocks, and harvest operations were being hurried in order to save as much of the crops as possible. A pair of Kestrels was busily engaged securing caterpillars for their nestlings. Numerous other birds were seen during the ramble. After early tea Miss C. C. Currie accompanied us on our stationward walk to within a mile of Drouin, her enthusiasm not being damped by a four-mile walk home by herself. All enjoyed the outing thoroughly, having been made so much at home by the members of the Currie family.

PAPERS READ.

1. By Mr. Alfred J. Tadgell, entitled "A Contribution to the Flora of the Victorian Alps."

The author said, as the result of five visits to the Alps in the neighbourhood of Mounts Feathertop and Hotham, he was able

to add 83 species to the 346 species listed in Prof. Ewart's paper, entitled "The Flora of the Victorian Alps," published in the *Naturalist* for October, 1910 (*Vict. Nat.*, xxvii., p. 104). He described in a pleasant way the experience of collecting in the Alps, and the sublime grandeur of the views obtained from the mountain road one traverses at five to six thousand feet above sea-level. He said that it was a pity the paper referred to gave no definition of what was considered Alpine; he had taken 2,600 feet as the limit for Alpine plants. Mr. Maiden, to whom he was indebted for several identifications, had taken 3,000 feet as the Alpine limit in his list of Kosciusko plants.

Several members congratulated the author on the interest of his paper, and gave their impressions of the Alpine regions.

2. By Mr. C. J. Cole, communicated by Mr. C. French, jun., entitled "Notes on the Caper Butterfly."

The author gave some account of the life-history of this butterfly, *Pieris teutonia*, which visited the Wangaratta district in myriads in November and December, 1920. Remarking that the migratory flights for which this butterfly is noted are probably caused by the insects searching for plants on which to deposit their eggs, the Native Caper, *Capparis Mitchelli*, being a comparatively rare plant in Victoria, he said that on this occasion the butterflies made use of the young tips of the orange trees on which to deposit their eggs, but he noted that, though the young larvæ seemed at first to thrive on this food, none of them lived longer than ten days. the same results being noted with regard to larvæ hatched in captivity.

NATURAL HISTORY NOTE.

Mr. C. Oke drew attention to his exhibit of a jumping spider, Attidæ, under the microscope, taken on the Ringwood excursion on 3rd September last. This he stated to be the prettiest spider he had seen, and doubted if any animal to be found around the metropolis was more brilliantly marked or more beautiful than this spider, when alive or freshly killed; unfortunately, some of the colours fade after death. The following is a brief description:—Cephalo-thorax black, with an iridescent purple metallic sheen, with fawn scales, interspersed with black hairs covering apical third. The two pairs of eyes projecting forward are light blue, two pairs on top black. Pedicels are clothed with white and yellow hairs. The abdomen is blackish and is clothed with brilliantly iridescent scales; these are white at base and apex, but the main colour is a beautiful turquoise blue, with a pattern of fawn intermingled. On each side is a semi-circular line, nearly meeting (in some specimens forming a circle, but this is unusual), and a small

crescent in middle of intensely bright red. The legs are fawn and brown.

Miss G. Nokes contributed a short account of the camp-out of the Mount William Tourist League, which members of the Club had been invited to join, held on the southern slopes of Mount William (Grampians) in November last. She reported that the scenery and vegetation greatly resembled other portions of the Grampians, and, when the locality has been opened up by tracks, would doubtless prove a great attraction to tourists, especially if it became possible to establish a hostel in the neighbourhood.

EXHIBITS.

By Mr. H. W. Davey, F.E.S.—Specimens of crustacean, *Phreatoicopsis terricola* (female), from Otway Forest.

By Mr. J. Gabriel.—Flowering branches of Silky Oak, *Grevillea robusta* (New South Wales and Queensland).

By Miss G. Nokes.—Flowering branches of *Kunzea peduncularis*, from Millgrove; paintings of orchids, *Pterostylis barbata*, *Lyperanthus nigricans*, and *Cryptostylis longifolia*.

By Mr. C. Oke.—A jumping spider, Fam. Attidæ (under microscope).

By Master C. Ralph.—Lepidoptera, collected at Spring Vale, November, 1921.

By Mr. L. Thorn.—Larvæ in various stages, pupa cases, and perfect insects of the Wood White Butterfly, *Delias aganippe*.

After the usual conversazione the meeting terminated.

EXCURSION TO BENDIGO.

The party of ten members who made the trip to Bendigo on Railway Picnic Day (1st October) were favoured with splendid weather, and an enjoyable time was spent. The locality selected for Saturday afternoon's trip lies to the east of the racecourse, at a distance of about two miles from White Hills. Thither we proceeded by char-a-banc, and then, passing through portion of the racecourse grounds and across the golf links, reached the race, where we partook of a belated luncheon. After spending an hour in this interesting locality, the party crossed the golf links to the Fosterville road at Ascot, and thence returned along the road to White Hills. Flowers were abundant. Altogether, seventy-seven species in flower were noted. Amongst shrubby plants, *Prostanthera hirtula*, a blaze of purple, attracted most attention, but numerous others, such as *Hibbertia acicularis*, *Olearia teretifolia*, *Eriostemon obovalis*, *Brachyloma daphnoides*, *Grevillea lanigera*, Leptospermum, and Calythrix were represented. Eleven orchids were collected,

the most notable being *Thelymitra Macmillani* and *Diuris palachila*. For Sunday the party made the trip to Flagstaff Hill, in the Whipstick, about 12 miles north of Bendigo, making a whole-day excursion. This locality is principally noted for an extensive patch of *Phebalium* (*Eriostemon*) *obcordatum*. This plant was, however, distinctly past its best, though fair specimens were still to be seen. A multitude of flowering shrubs, notably *Bæckea diffusa*, *Micromyrtus* (*Bæckea*) *microphylla*, *Calythrix tetragona*, Olearia, *Boronia anemonifolia*, *Eriostemon obovalis*, *Loudonia Behrii*, and *Brachyloma daphnoides*. Seventy-one species were recorded for the day. Several of the party took the opportunity of collecting seedling plants for cultivation. Messrs. Oke and Thorn, who devoted themselves to entomology, reported satisfactory results in their several departments. Not many birds were observed, but a Flycatcher's nest was seen in a small shrub, with one egg and a Cuckoo's egg in addition.

Accounts of previous excursions to Bendigo will be found in the *Naturalist* for November, 1919, and December, 1920. On this occasion, owing to the lateness of the season, a large number of plants not previously seen on these excursions were noted, including the following :—

RANUNCULACEÆ—
ft Ranunculus parviflorus.

DILLENIACEÆ—
Hibbertia stricta.

PITTOSPORACEÆ—
b Pittosporum phillyræoides.

RUTACEÆ—
Phebalium obcordatum.

LINACEÆ—
Linum marginale.

CARYOPHYLLACEÆ—
Sagina apetala.

LEGUMINOSÆ—
Pultenæa largiflorens.
Eutaxia empetrifolia.
Templetonia Muelleri.
Swainsona tephrotricha.

ROSACEÆ—
Acæna ovina.

HALORAGEÆ—
Haloragis teucrioides.

MYRTACEÆ—
Micromyrtus microphylla.

COMPOSITÆ—
Brachycome exilis.
Vittadinia australis.
Leptorrhynchos squamatus.
Helipterum dimorpholepis.
b Helichrysum apiculatum.
o Cassinia aculeata (var.)
Rutidosis pumilio.
Cotula coronopifolia.

STYLIDEÆ—
Stylidium perpusillum.
Leewenhoekia dubia.

GOODENIACEÆ—
Goodenia pinnatifida.

GENTIANACEÆ—
Sebæa ovata.

ORCHIDACEÆ—
Thelymitra aristata.
antennifera.
Macmillani.
Diuris palachila.
b Calochilus Robertsoni.
b Pterostylis rufa.

LILIACEÆ—
Bulbine bulbosa.
Arthropodium strictum.
Xerotes Brownii.

CYPERACEÆ—
Schœnus apogon.
Carex paniculata.

We are indebted to Mr. C. Oke for the following notes about the beetles observed :—" On the last two excursions to Bendigo about 100 species of beetles have been taken. This seems a very small number for six days' collecting. Every method of collecting has been tried, but the greater part of the time has been spent in searching ants' nests for inquilines, which, though not very prolific in species, has yielded some very interesting beetles. Many of the species are common around Melbourne, and have been omitted from list : others occur near Melbourne, but are fairly rare ; but most of these species are not known around the metropolis. Scarabidæ : Cryptodus piceus, Germ., in nests of Iridiomyrmex detectus and Ectotomma metallicum. Carabidæ : Mecyclythorax lateralis and M. punctatus. Scopodes boops were in dozens under leaves at Flagstaff Hill. Three species of Staphylinidæ in ants' nests. Pselaphidæ : * Articeras curvicornis, West., * A. dilaticornis, West., * A. fortnumi, Hope, * A. eremogastri, Lea, and * A. irregularis (?), Lea. Paussidæ : Arthropterus howitti (?), Macl. (♂ and ♀ in nest of E. metallicum). Histeridæ : * Chlamydopsis, n. sp. Cucujidæ : Nepharis alata, Cast. (with I. nitidus). Ptinidæ : * Diplocotes foveicollis, Oll., * Paussoptinus laticornis, Lea, * Diphobia familiaris, Oll. Tenebrionidæ : Chalcopteris minor, Blackb. Curculionidæ : Oxyopes fascicilis, Lea. Acantholopus spinniger, Macl., Sclerorinus tuberculatus, Macl. [Those marked by an asterisk were found with small black ants under stones.]"

D. J. Paton.
C. Daley.

EXCURSION TO ELTHAM.

In spite of the fact that it was "Henley Day," and that the weather conditions were likely to be unsettled, thirteen members and friends attended the excursion to Eltham on Saturday, 22nd October, 1921. The popular superstition attached to the number thirteen proved to be at fault for once, as in every way the outing was full of profit and pleasure to all concerned. The afternoon train journey of sixteen miles was enhanced owing to the beauty and freshness of the country after the recent warm rains. Wild-flowers were blooming freely, birds were busy with their household arrangements, fields were clad in their spring costumes of green, and gum-tips were glowing with colour. Nature was everywhere smiling. It was one of those days that the poet has described—

> "When Summer came with lips of flame
> The gentle Spring to woo."

The party was met at Eltham by the leaders, and took the track that usually crosses the Diamond Creek, but found for once that the order had been reversed, for the creek at flood

height had considerably crossed the track—so much so that the vehicular bridge was submerged and lost to view, and a precarious, frail-looking emergency structure had to be negotiated. In order to avoid trespassing on private property, the hill that rises abruptly on the northern side was climbed, but the excursionists soon descended again to the banks of the flooded stream, and followed its tortuous course for some distance. It was here the beauty of the district appealed to the artistic elements in the party: the park-like glades, the glimpses through the leafy canopy of the township and hills in the distance, the imposing big gums, but, above all, the picturesque windings of the creek, called forth many expressions of pleasure and delight. It must have been such a similar scene that inspired the lines of J. B. O'Hara—

> "The winding creek goes singing
> By maidenhair and moss;
> Along its banks, in rosy ranks,
> The wild-flowers wave and toss."

Mr. Tonge, the ornithological leader, deplored the ravages amongst the birds during the nesting season of those two allied pests, the human and the feathered jackass—the first-named represented by boys. Both are ruthless destroyers of the young native birds and eggs. He escorted the party to a number of nests, some used this season and already vacated, some in process of completion, and others still in occupation. The first found was that of the Striated Tit-Warbler, *Acanthiza lineata*, hanging in a branch of a young Red Box tree. The next was a Wattle-bird's, *Acanthochæra carunculata*, built in the centre of a bunch of mistletoe very high up in a White Gum. Near and around the banks of the creek were seen and heard the Fantailed Cuckoo, *Cacomantis rufulus*, Pallid Cuckoo, *Cuculus inornatus*, Sordid Wood-Swallow, *Artamus tenebrosus*, Grey Thrush, *Colluricincla harmonica*, Black-and-White Fantail, *Rhipidura tricolor*, and several species of the honey-eaters, including the White-plumed, *Ptilotis penicillata*, and Yellow-faced, *Ptilotis chrysops*. A nest of that interesting bird, the Tawny Frogmouth, *Podargus strigoides*, was discovered about 25 feet up. The wonderfully symmetrical nest of the White-winged Chough, *Corcorax melanorhamphus*, was also found, containing young birds. It was built in a Stringybark tree. Three eggs of the Black-faced Cuckoo-Shrike, *Graucalus melanops*, were in a nest built in a horizontal fork of a Peppermint. This is a remarkably small nest for the size of the birds, a pair of which were flying about in its vicinity. Parent birds were also watching about the nest of the Butcher-Bird, *Cracticus destructor*, and their rich carolling was frequently heard. The young birds were close by. The Rufous Whistlers, *Meliphaga phrygia*, were everywhere, there being such an abundance of

the cup-moth and other caterpillars, their natural food supply. On arrival at Mr. Tonge's residence the members of the party were entertained at afternoon tea by Mrs. Tonge, and, although several had to hurry away to catch the early return train, the majority remained to spend an enjoyable hour inspecting the leader's collection of nests, photographic bird studies, and, more particularly, a few of his oil and water-colour pictures painted from Nature. In the grounds a Goldfinch's nest, with its clutch of eggs, was viewed in an apricot tree. A Yellow-tailed Tit-Warbler's, *Acanthiza chrysorrhoa*, nest was also noted. Mr. Tonge discovered two eggs therein, and also an egg of a Bronze-Cuckoo; but all had been deserted on account of a young frog finding its way into the nest and sitting on top of the eggs. A Brown Flycatcher, *Micræca fascinans*, was observed sitting on its tiny nest, which contained two newly-hatched young ones. The beautiful Regent Honey-eater, *Meliphaga phrygia*, which frequents the district, was not noted during the visit. On behalf of the visitors, Mr. Keep voiced their appreciation of the efforts of both Mr. and Mrs. Tonge to make the afternoon so pleasant and enjoyable. The excursionists reached Melbourne at 7.45 in the midst of the final Henley Day festivities, thoroughly satisfied with the afternoon's outing.

The following birds, observed by Mr. Tonge during several years in the vicinity of his residence, will give some idea of the ornithology of the district (names according to Leach's "Bird Book," first edition):—

Quail, Stubble.
——, Brown.
——, Painted.
Pigeon, Bronzewing.
*o*Heron, White-necked.
———, White-fronted.
Goshawk, Australian.
o———, Lesser.
Sparrow Hawk, Collared.
Eagle, Wedge-tailed.
o———, Little.
*o*Kite, Australian Black-shouldered.
Hawk, Brown.
*o*Kestrel, Nankeen.
Owl, Boobook.
*Cockatoo, Rose-breasted.
o———, Gang-Gang.
o———, White.
*Lorikeet, Little.
*———, Musk.
Parrot, Crimson.
———, Rosella.
*———, Swift.
Frogmouth, Tawny.
Nightjar, Owlet.
Kingfisher, Laughing.
———, Sacred.
Cuckoo, Pallid.
———, Fan-tailed.
———, Narrow-billed Bronze.
———, Bronze.
Swallow, Welcome.
Martin, Tree.
———, Fairy.
*Flycatcher, Australian Brown.
Robin, Scarlet-breasted.
*———, Flame-breasted.
*———, Pink-breasted.
———, Hooded.
Tree-Tit, Short-billed.
Fantail, White-shafted.
———, Rufous.
———, Black-and-White.
Flycatcher, Restless.
Ground-Bird (Thrush), Spotted.
Thrush, Australian Mountain.
Chat, White-fronted.
Warbler, Speckled.
Tit-Warbler, Little.
———, Brown.

o Occasional visitors. * Do not nest in district.

Tit-Warbler, Striated.
————, Yellow-tailed.
————, Buff-tailed.
Warbler, Superb.
Wood-Swallow, White-browed.
————, Masked.
————, Sordid.
Magpie-Lark.
Shrike-Thrush, Grey.
Magpie, White-backed.
Butcher-Bird, Australian.
Shrike-Tit, Yellow-breasted.
Whistler, Golden-breasted.
————, Rufous-breasted.
Shrike-Robin, Yellow-breasted.
Tree-creeper, Orange-winged.
————, Brown.
————, White-throated.
White-eye.
Flower-pecker, Australian.
Diamond-Bird, Red-tipped.
Diamond-Bird, Orange-tipped.
————, Yellow-tipped.
————, Spotted.
Honey-eater, White-naped.
————, Spinebill.
————, Regent.
————, Yellow-faced.
————, Yellow-plumed.
————, White-plumed.
————, White-cheeked.
Wattle-Bird.
Miner, Noisy.
*Honey-eater, Blue-faced.
*————, New Holland.
Pipit, Australian.
*Finch, Spotted-sided.
*——, Red-browed.
Oriole, Olive-backed.
Chough, White-winged.
Bell-Magpie, Grey.
o————, Sooty.

E. S. Anthony.

EXCURSION TO FRANKSTON.

On Saturday, 12th November, one member and the leader formed the advance guard at Flinders-street. At Frankston four additional members were joyfully recognized. It was proposed to first visit Landslip Point, where Janjukian fossils can be collected from the ironstone, but as the tide was still high we proceeded along the main road towards the farthest objective. A short distance out of Frankston a high cutting on the roadside shows the remains of a raised beach, well above high water mark. Just past the hook bend of the Frankston road we turned down a well-made road past "Trescote," which terminated in a track leading to the beach. Here the red and purple ferruginous sands, apparently unfossiliferous, present a most *bizarre* appearance, being splashed with large patches of whitish "clay-galls" that have been bleached, probably by original organic matter. One member observed how unnatural this would seem if reproduced in a painting; it formed a very vivid break in the placid harmony of the adjacent seascape. In one spot the ironstone was covered with the tracks of fossil worms, showing the conditions at that time to have been inter-tidal. As the day was sultry the walk was taken leisurely, some members going over the cliff, whilst others pushed on along the shore. The party rejoined at Grice's Creek, where the billy was boiled, the intervals being filled in with fossil collecting and a discussion on the relationship of the rocks—bluestone, sandstones, and clays—met with at this

o Occasional visitors. * Do not nest in district.

spot. Mr. A. E. Kitson's report, published in 1900,* was referred to, and the leader remarked how much of his interpretation of this complex is still upheld by investigators, except as to the age of the Balcombian clays and the ferruginous rocks. The large cement-stones commonly met with in the Balcombian beds are here seen in distinct bands marking the planes of bedding. On the return journey the shore was traversed for some distance. The shells left by the receding tide were mostly broken, but the huge quantity of *Mesodesma*, sp., was especially noted, skirting the shore-line for miles. The alien Yellow Horned Poppy, *Glaucium luteum*, brightened up the foreshore with its glaucous-green, great shrubby masses and showy flowers, striking a reminiscent note of wanderings along the shores of Kent and Sussex. Turning inland between Dennant and Bullart Creeks, the Frankston road was rejoined in time for members to catch the 6.48 train to town. The Balcombian clays of Grice's Creek are rich in fossils, and appended is a list of those collected on this excursion by Mr. F. A. Cudmore and the leader :—*Foraminifera.*—Miliolina tricarinata, Nodosaria soluta. *Corals.*—Bathyactis lens, Balanophyllia armata, Flabellum gambierense, F. victoriæ, Placotrochus deltoideus, P. elongata, Sphenotrochus australis. *Echinoidea.*—Cidaris (Leiocidaris). *Polyzoa.*—Cellepora tridenticulata, var. nummularia, Lunulites rutella. *Bivalves.*—Amussium zitteli, Arca cainozoica, A. crustata, Cardita delicatula, C. scabrosa, Carditamera alata, Cardium hemimeris, Crassatellites communis, Cucullæa corioensis, Dimya dissimilis, Glycimeris maccoyi, Leda *cf.* apiculata, L. huttoni, L. vagans, Lima bassi, Limopsis maccoyi, L. morningtonensis, Meretrix eburnea, Nucula obliqua, Ostrea hyotidoidea, Pecten yahliensis, Sarepta obolella, Semele krausei, Spondylus pseudoradula, Trigonia tubulifera, Venus cainozoicus, *Scaphopoda.*—Dentalium subfissura, D. mantelli. *Gasteropoda.*—Ancilla pseudaustralis, Argobuccinum pratti, Bathytoma rhomboidalis, Bela (Daphnobela) gracillima, Bullinella *cf.* angustata, B. *cf.* exigua, Calyptræa undulata, Cancellaria varicifera, Colubraria tenuicostata, Columbarium acanthostephes, C. craspedotum, Columbella balcombensis, Conomitra ligata, Crepidula dubitabilis, Cypræa contusa, C. eximia, var. brevis, Erato morningtonensis, Fusus senticosus, Latirofusus aciformis, L. exilis, Lotorium protensum, Mangilia bidens, Marginella inermis, M. propinqua, M. wentworthi, Mitra atractoides, Murex amblyceras, M. lophœssus, M. velificus, Nassa tatei, Natica limbata, N. perspectiva, N. polita, Newtoniella cribarioides, Scaphella maccoyi, Siliquaria occlusa, Trivia avellanoides, Turritella platyspira, Voluta ancilloides, V. limbata, V. strophodon, Volutilithes antiscalaris.—F. CHAPMAN.

* Geological Survey of Victoria—Monthly Progress Report (New Series), No. 12, pp. 3-13 (with map).

A DAY'S BEETLE-COLLECTING AT THE LERDERDERG.

By CHARLES OKE.

(*Read before the Field Naturalists' Club of Victoria, 8th August*, 1921.)

I HAD often looked at the Pentland Hills on the map, and wished I could get there to do some collecting; it was therefore a great pleasure to me to see the Lerderderg Gorge on the 1920–1 excursion programme for 30th October. Leaving town by the 7.40 train for Bacchus Marsh, we arrived there about nine, and were soon seated in the cab that was to convey us to the Gorge. The road out did not look at all inviting to an entomologist, and gave no indication of what an interesting spot we were going to.

On arriving at the end of our drive of six or seven miles we were only a few hundred feet from the entrance to the Gorge. We walked down to the river, but found it impossible to cross, and at first glance it seemed equally impossible to proceed up-stream on our side of the stream, on account of the steep cliff around which the river flows; but by scrambling up a steep bank we reached a water-race, and then a flume, thirty or forty feet above the water. Fortunately, no water was running in this flume at the time, so we were able to walk along it, around the cliff, to where we could walk along the embankment. I had not gone far along this before I saw some moss growing on the side of the hill. A bag of this was obtained for teasing over white paper at home; but it did not contain anything fresh to me, the only beetles obtained from it being a small common Staphylinid, some small weevils of the genus Mandalotus, and a Pselaphid of the genus Pselaphus. The beetles of this genus are remarkable for the great development of the maxillary palps. In the present species they are very large and sharply elbowed, and are longer than the antennæ, and might easily be mistaken for a second pair of antennæ. The eyes are large, strongly convex, and coarsely fasciated, and under a lens resemble small blackberries.

Amongst some leaves near this moss I found a very small beetle, a Trichopterygid: it is about the size of the head of a very fine pin. Though these beetles are so small, there is no degeneration of their structure. Their anatomy is as complex as is the largest insect's. A peculiarity about them is the bristles on the antennæ, and the wings being fringed. These latter make a nice object for the microscope, under which they somewhat resemble a feather. A little further along the bank I turned over a few stones and found several species of ants had their nests under them, and it was not long before I had made my first good capture for the day—a Pselaphid that was new to me, of the genus Tmesiphorus. In this genus the

palps are well developed, but not nearly so long as in the first-mentioned genus, and the antennæ are distinctly clubbed. This beetle was taken from the nest of *Amblyopone australis*, a slow-moving, yellowish ant, with a very nasty sting. A nest of Pheidole ants contained another Pselaphid, Bryaxis (sp. ?), and it was carefully taken on a wetted grass stem.

I now found that I had been left behind by the rest of the party, and, failing to receive an answer to a couple of "Coo-ees," decided it was no use trying to catch up. Without intending to do so, I was soon climbing up the side of the hill, going from stone to stone, and, though I had intended to keep along the river to where the Gorge opens out a little, the sight of another stone just a little bit ahead kept me going up instead of along. About half-way up I turned over a stone, under which was a nest of *Ectatomma metallicum*. Everybody must know this ant by sight, if not by name. It is about a quarter of an inch long, of a rich metallic purple and green, and is generally called the "Green-head." After watching the nest for a few minutes, I noticed what looked extremely like an ant, slightly larger than the others, but which, unlike the rest of the ants, was keeping still. When I touched it, however, it put out eight legs and ran away. This spider, when at rest, is very like an ant, but when running the resemblance is not so good. I have fairly often seen this spider in ants' nests, but have never seen one out of the nests. Turning over another stone, just a few steps away, I found a nice nest of the "Green-head," and amongst the rubbish in the nest found what I had come to hunt for—a Chlamydopsis. The beetles forming this genus are most remarkable insects. Professor Westwood, who described the genus, considered it the most remarkable he had seen. When at rest they are all "shut up." The head is retracted into the prothorax, the first joint of the antennæ lies around the head (covering the eyes), the small joints are bent, and the club is received into a hollow in the front of the prothorax. So completely withdrawn is the head and its antennæ that it leaves the front of the prothorax quite smooth and perpendicular; and it is only by the aid of a good hand lens that the top of the head can be made out. In some species the legs are received into grooves in the sides of the body. The legs themselves are grooved—the femora to receive the tibiæ, and the tibiæ to receive the tarsi. Another peculiarity about them is that they all have a large depression in the elytra (wing-cases) near its base, and on the sides of this, or near the shoulders, are fascicles of peculiar hairs. What these fascicles are for we do not know, but it is evident that they must be connected with a gland which secretes some substance, which is either a further means of defence or is something the ants are fond of. It is probably the latter; but,

if so, why the remarkable provision for closing up as a means of defence? The species I had taken was *ectatommæ*, so called because it associates with that ant. It is known by the transverse striæ around the scutellar region, with very inconspicuous fascicles.

On the top of the hill, in a "white ants'" (Termites') nest, I found a Pedilophorus, an unusually large specimen. Under the bark of a gum-tree I found a pair of nice Eucnemids and several species of Carabidæ. Over the other side of the hill, in a beautiful old nest of the "Green-head," I took yet another prize—*Chlamydopsis longipes*, Lea. This species, as its name implies, has remarkably long legs—more than twice the length of the body. I worked along the hill a bit, but found it very dry, so decided to go back to the river. On the flat near the river are enough stones to spend weeks looking under, so there was no need to walk far—in fact, for two or three hours I hardly stood upright, the stones being so close that it was only a waste of time to straighten oneself. Here, in the nests of a small black species of Iridiomyrmex, I took a number of Pedilophorus (sp. ?)—a small black species covered with rather long hairs. Though Pedilophorus has been taken from ants' nests before, I do not think they are "inquilines." I feel sure the ants use them as food for their larvæ. Their usual habitat is, I fancy, moss, from which I have taken them. I took one from the mandibles of an ant. I had certainly disturbed several nests of these ants, and this ant might have been taking the beetle to a place of safety, but it appeared to me to be coming to the nest from the hills. Here I took two specimens of a Microchestes from nests of "Green-heads." These are peculiar little tufted beetles of the family Byrrhidæ. When resting their heads are bent under the thorax, and the legs are received into grooves in the body. On this little flat I took a second specimen of *C. ectatommæ*, with the humeral region a bright red. There is a lot of mistletoe growing on the trees here, and I noticed it was very much infested with a large scale. There were a fair number of the Wood White, *Delias aganippe*, butterflies, and a few Caper Whites, *Anaphæis java teutonia*, flying about, and I saw a fine specimen of that rare Victorian butterfly, *Papilio stenthelus*, settle on a bush, but, being without a net, could not catch it. A bush of the Native Hop, *Daviesia latifolia*, had a number of that pretty little beetle, Augomela, on it, and it looked very pretty on the bush. A small Staphylinid was taken from an ants' nest, and two other species from amongst some dead leaves on the ground.

Nearly every stone had a nest of some species of ant under it, but inquilines, with the exception of a small Rodwayei, were hard to find. About twenty species of ants were disturbed, the most common being the "Green-heads" and the small

black Iridiomyrmex. I did not see a single specimen of that favourite host of so many beetles, *Iridiomyrmex nitidus*; perhaps if I had tried more amongst the timber I would have come across it. One nest that interested me very much was that of *Leptomyrmex erythrocephalaux*, it being the first time I had seen the nest of this ant. This is a remarkably long-legged species, and gives off an odour something like the meat ant, *Iridiomyrmex detectus*. There were about thirty ants visible when I turned over the stone, and they looked very queer the way they wandered about, some of them standing up as high as their long legs would allow them. Another rarity was a large ant like a "bulldog," black, with red thorax, the nest of which I have not seen, nor have I heard of anyone who has.

About 5 o'clock I found I had forgotten to have my lunch, and the strenuous work of stone-turning had given me a decided hungry feeling, so I made back to where I had left my bag—at the first ants' nest met with. After eating a couple of sandwiches I decided it was too dry without a drink, so went in search of a spot where I could reach the water. Scrambling down the embankment, I easily reached the water's edge, and prepared to have my belated lunch, but, noticing ants running in and out of a hole under a stone, I turned it over, and lunch was again put off. Amongst the little black ants I got another Pselaphid, *Articerus curvicornis*, West., and, turning over another, I saw three Articerus, which I took to be the same species, so that when I had caught one, and saw something run under another stone, I did not bother to look at the beetle on my finger for a minute, but when I did I saw it was a very different species, *A. constrictiventris*, Lea, and, though I searched for some time, I searched in vain for the other two. The beetles of this genus (Articerus) are peculiar on account of the antennæ being reduced to a single joint, and having an excavation on the top of the abdomen. This excavation has hairs along its lateral margins, and these are attached to secretory glands. *A. curvicornis* has the antennæ flattened in the middle but round at ends, apex truncate, and large setæ protruding from mouth. What can be the function of this bristle-like projection? In *constrictiventris* the antennæ are circular throughout, while the abdomen is suddenly constricted at base.

Running on the stones were numbers of a pretty little Staphylinid, which I took to be *Paederus cruenticollis*, Germ., and, as this is very common, I only took the one specimen; however, on examination at home it proved to be *P. australis*, Blackb., a much rarer species. Several species of Carabidæ were also found amongst the stones near the water's edge, mostly common things; but I was fortunate enough to secure a single speci-

men of *Tachys monochrosa* and three species of Clivina. Long before I had exhausted the possibilities of this spot I heard the other members of the party returning along the race, and, as they seemed to think it was time to get back for the cab, I had reluctantly to leave, hoping that I might be able to revisit the spot at no distant date.

To Mr. C. C. Brittlebank I owe very many thanks for enabling me to visit so profitable a collecting ground, for, though the number of species collected—forty-one—was not so very many for a day's collecting, the rarity of some of them more than made up for any paucity of numbers.

LORD HOWE ISLAND : A NATURALIST'S PARADISE.—According to an article by Mr. Allan R. M'Culloch, in the *Australian Museum Magazine* for August, there is every chance of Lord Howe Island losing its charm for naturalists, and even becoming uninhabitable. He says :—"Two years ago the forest of Lord Howe Island was joyous with the notes of myriads of birds, large and small, and of many kinds. Doves wandered fearlessly around one's feet on the main roads, and the bush resounded with their cooing. Doctor-birds, *Aplornis fuscus*, made their appearance in the garden clearings every evening, and with the Fantails (Rhipidura) even wandered through the houses in search of insects and crumbs. Silver-eyes played havoc in the fruit-trees, while Thickheads and a dozen others added to the general chorus. They were unmolested save by each other, the residents of the island rarely disturbing their harmony. To-day, however, the ravages of rats, the worst enemy of mankind, accidentally introduced, have made the note of a bird rare, and the sight of one, save the strong-billed Magpie and the Kingfisher, even rarer. Within two years this paradise of birds has become a wildreness, and the quiet of death reigns where all was once melody. One cannot see how the happy conditions are to be restored. The very few birds remaining are unable to breed, being either destroyed upon their nests or driven from them by the rats and their eggs eaten. One can scarcely imagine a greater calamity in the bird world than this tragedy which has overtaken the avifauna of Lord Howe Island. With the birds gone, injurious insects have increased unchecked, and are destroying the produce of the island gardens. Fruit-flies have ruined the peaches, and caterpillars of many kinds are stripping the leaves from shrubs and trees. The rats also eat the corn ere it ripens, and extract the pulp from bananas, pomegranates, and other fruits while they are hanging on the trees. Nothing is safe from their rapacity, and dire distress threatens the residents unless some unexpected cause brings about a reduction of the rats and an increase of insectivorous birds."

NOTES ON MUELLER'S LITERARY WORK.

By E. E. PESCOTT, F.L.S.

(*Read before the Field Naturalists' Club of Victoria, 16th Oct.*, 1921.)

AFTER being a student and collector for nearly twenty years of the written work of the great man who passed away twenty-five years ago to-day, I now find myself quite incapable of, and my powers quite inadequate for, the task of writing a satisfactory appreciation of his literary genius. Hooker called him "the prince of Australian botanists"; J. H. Maiden said "he was the last of the great botanical explorers—one of a peculiarly brilliant trio, the other two members of which were Robert Brown and Allan Cunningham."

Botanical students the world over must feel it a very great loss not to be able to turn to a complete bibliography of this, the greatest botanical worker that Australia has ever seen. Although many suggestions have been made from time to time, nothing whatever has been done to give to the world a complete catalogue of his literary works. When writing an obituary notice, Mr. J. H. Maiden, Government Botanist of New South Wales, said:—"In fact, so vast has been the influence of Mueller upon Australian botanical science that a *catalogue raisonné* of his works has become an imperative necessity" (*Agr. Gaz. N.S.W.*, Nov., 1896, pp. 742–745). This "imperative necessity" has never been realized. After twenty-five years we have no published record of the works of this great man.

It is indeed a fortunate circumstance that the Baron was induced to prepare a list of his earlier writings when Joseph Armin Knapp published a biographical sketch of his life in 1877. Knapp's sketch was published in a German publication, and in the German language. It was afterwards reprinted in pamphlet form. I am indebted to Mr. Gerhardt Renner for a copy of this very rare reprint (as well as for others), which is prefaced by a woodcut of the Baron in the prime of his life. The reprint contains a complete list of the Baron's works, including collaborations, translations, and other writings up to the year 1877. From that date there is no published record of his literary work. There is, in the library of the National Herbarium of Victoria, a large folio manuscript book containing a fairly complete record of the Baron's written work. This was compiled by his literary executor, Rev. W. Potter. It is neither thoroughly accurate nor complete, but it is a splendid foundation for some future worker. It contains some hundred or more pages, with lists of Mueller's writings all chronologically arranged in good sequence. Why this bibliography was never published we can merely conjecture. It should

have been done immediately after his death, and the neglect of the performance of such an important duty is a matter for very great regret.

Mueller's literary work was almost wholly confined to Australasian subjects. Before leaving Europe he had compiled a flora of a portion of Schleswig-Holstein. This was written before 1847, but was not published till 1853. On his arrival in South Australia his studies of the flora around Adelaide resulted in several articles appearing in print; and from that date until his death the Baron was a most prolific author. His writings were not alone confined to botany of living plants, for his descriptions of fossil plants and fruits are well known. His versatility is also shown in his historical articles, notably the one on the occasion of the celebration, in the Melbourne Town Hall, of the Columbus jubilee (1492–1892). His "List of Birds Visiting the Melbourne Botanic Gardens" (1869) shows his grasp of other nature subjects than botany.

I think his greatest monumental work—one which will stand above others for all time—is the "Fragmenta Phytographiæ Australiæ." The first part was published in 1858, and the last in 1882. As every botanist knows, there are eleven volumes, all written in Latin, and a fragment, which is rare, being the first part of vol. xii. Here were published very many of his species; new locations and new discoveries are also recorded. It is a classic, and one always necessary to students of Australian plants. Strangely enough, this was, as well, his first among the larger and more important publications. It is, in one way, difficult to understand why Mueller did not continue to issue this valuable work. The final fragment above referred to was published in 1882, fourteen years before his death. Possibly the demand for more "popular" works was the cause of its discontinuance. Only five years previously he had issued what is now considered to be his only "popular" work, his "Introduction to Botanic Teachings in Schools," and this was being largely used and discussed. His "Eucalyptographia" was also running through its ten numbers at this period, to be followed by the Acaciæ, Myoporineæ, and also Salsolaceæ. These valuable works, so freely and accurately illustrated, all tended to make botanical studies popular, and they were then, as they are still, much in demand. J. H. Maiden has said that "'Eucalyptographia' is sufficient to make the reputation of any man." The same might be said of any of Mueller's monographs. These quarto volumes are still standard works of reference on those plants so discussed.

The magnificent quarto volume, "Plants Indigenous to the Colony of Victoria," which was issued as vol. i. in 1860–62, was really the beginning of a work which Mueller wished to

issue as the standard work on Victorian plants. Unfortunately, we only have one volume of this, with the additional volume of plates. Just at this time Mueller was very hard at work, in collaboration with Bentham, on the historic "Flora Australiensis." (Bentham's great tribute to Mueller in the preface of that work stands as a monument to his magnificent unselfishness and devotion.) We can readily, therefore, understand how that Mueller would again give up his own local efforts in order to be of benefit in the wider sphere—a flora of the continent. In 1879 Mueller issued the first part of what, if continued, would have been an invaluable work of reference to students of our plants. This was "The Native Plants of Victoria Succinctly Defined," Part I. It gives in its 190 pages a botanical record of known plants from Ranunculaceæ to Nyctagineæ, including 40 families and 121 genera. The volume is well illustrated with wood-cuts ("xylographic illustrations"), and, if completed, would have been of far greater use than the well-known "Key." But force of circumstances compelled him to abandon this work, along with several others, to carry out other duties under official instructions. The work which went through more editions than any other is the "Select Plants Readily Suitable for Industrial Culture." This work had its genesis in an article of about 30 pages in the Annual Report of the Acclimatization Society of Victoria, 1871; but no doubt, judging from his writings, Mueller had it in mind for many years before this. The "Select Plants" appeared, with additions, in the same publication in the next year; it was also issued in vol. ii. of Mueller's book, "Lectures and Documents on Industrial Research," 1872. A supplement appeared in the Acclimatization Society's fourth report of 1874; but in 1876 it was considered to be of sufficient importance to stand alone. Thence it passed through many editions, the last being issued in 1895. So valuable a work attracted attention right throughout the world; and thus editions for New South Wales (two), United States of America (two), and India were issued. It was also translated into Spanish, French, German, and Italian.

Then we have his two "Census of Australian Plants." The first, issued in 1882, had four additional supplements, while the second was issued in 1889. This, with its literary and regional records, is still our only work of reference as a plant census.

To the early members of this Club must be given the credit for initiating the movement which resulted in the issue of the "Key to the System of Victorian Plants," in two volumes (1885–88). Though the compilation of this work was well known to be distasteful to the Baron, he persevered, and worked, as always, with his usual unselfish patriotism. And

who shall deny its value? What student of to-day can say that it may be done without?

Mueller's shorter articles, which range in content from a few pages down to a dozen lines, it is quite impossible to discuss. They were scattered all over the world by the dozen, in all kinds of publications, obscure as well as prominent, and written in many languages. They total some hundreds. Indeed, I doubt if they can ever be collected into a complete record, and yet each and all are valuable records of travel and investigation.

One aspect of Mueller's writing has before been suggested, but a few words might be said here in regard to that aspect—viz., the modern application of their teachings. Not only his large and important works, but his briefer records and diagnoses, are wonderfully up-to-date. Mistakes there are—of course there must be some errors of judgment in the thousands of pages of literary effort; but in both the foundation and the superstructure of the work of this master mind the works are still valuable as references to to-day's botanical research. His modern trend is clearly shown in the last words of his lecture delivered in June, 1871—50 years ago—on the subject of "Forest Culture." He wrote:—"I regard the forest as an heritage given to us by Nature, not for spoil or to devastate, but to be wisely used, reverently honoured, and carefully maintained. I regard the forests as a gift, entrusted to any of us only for transient care during a short space of time, to be surrendered to posterity again as an unimpaired property, with increased riches and augmented blessings, to pass as a sacred patrimony from generation to generation." I venture to say that were this lecture delivered to-day as it was fifty years ago it would be accepted as quite the modern acceptance of forest culture for Australia.

I must here refer again to the great and unselfish character of the Baron, which was shown in several ways. Reference can only be briefly made to his giving the whole of his private fortune to charitable and publishing objects. If he wanted a work, and the State would not publish it, he would issue it at his own cost. The Melbourne *Argus* estimated that he spent over £20,000 in the cause of science! When his "Select Plants" was issued in the French language, translated by Naudin, the title-page gave the greater credit to the translator than to the author. The book contains a picture of Naudin, *not* of Mueller, the greater mind. Yet he never complained. Again, when Elwood Cooper, of California, issued the work on "Eucalyptus Trees," by *Elwood Cooper* (as the title-page shows), it was merely a reprint of many of Mueller's published works and lectures, with a dozen lines of preface

by Cooper.* I think this is one of the most disgraceful cases of plagiarism on record. Yet Mueller gladly issued copies of this work to his friends. On the other hand, it must be noted that whenever the Baron translated any work, notably Wittstein's "Organic Constituents of Plants," he was always careful to credit the author with the work, claiming merely the translatory efforts.

In concluding this brief sketch, may I be permitted to ask, Are we ever to see a published biography and bibliography of the greatest botanist Australia has ever seen? Surely such a tribute has not been so long delayed as to be considered too late. The centenary of his birth occurs in a few years (1925), and perhaps we may by that time see a realization of the hopes of true lovers of Australian botany and its workers—viz., a commemoration record of life and works of the "Prince of Australian Botanists."

"THE AUSTRALIAN MUSEUM MAGAZINE."—The third number (December) of this new quarterly is to hand, and fully carries out the aim of the editor as set forth in the first number (April). The contents of each number are varied and splendidly illustrated, and it has been so sought after by persons interested in natural history expressed in a popular way that copies of the first number are unobtainable, though an edition of one thousand copies was issued. The articles are by members of the Museum staff, and deal with subjects Australian and extra-Australian. The letterpress is good and the printing of the half-tone blocks excellent, while the price charged (one shilling) is extremely moderate for a publication of such merit. Perhaps the most interesting article in the current issue is the report of a lecture delivered at the Museum by Dr. W. K. Gregory, Curator of Comparative Anatomy in the American Museum of Natural History, New York. The lecture was entitled "Australian Mammals, and Why They Should be Protected." The report is splendidly illustrated, and the comparisons drawn between our marsupials and the animals of other countries are most instructive and interesting. Speaking of the enormous numbers of 'possum skins sold in the United States yearly, obtained mainly from Queensland, he points out that the animals, instead of producing a monetary return, must soon become extinct, and those depending upon their capture must turn their attention to something else.

* There must be more than one edition of this work, for Mr. J. H. Maiden refers to a copy in which there is a brief lecture by Cooper, prefacing the Mueller reprints. Mr. Maiden does not look on this as plagiarism, as he considers that Mueller gave Cooper the necessary permission to reprint.—E. E. P.

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The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

Published 9th February, 1922.

Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

PAGE

FIELD NATURALISTS' CLUB OF VICTORIA 103

A CONTRIBUTION TO "THE FLORA OF THE VICTORIAN ALPS." BY ALFRED J. TADGELL.. 105

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Field Naturalists' Club of Victoria

ROOMS ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 13th FEBRUARY, 1922.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Member—	Proposer.	Seconder.
Mr. H. J. Cruickshank, Railway Offices, Spencer St., Melbourne.	Mr. F. Pitcher.	Mr. E. E. Pescott, F.L.S.
As Country Member—		
Mrs. E. A. Tavaré, Harrietville.	A. J. Tadgell.	H. G. Hooke.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

   1. By Messrs. J. Tovey and F. P. Morris—"Notes from the National Herbarium.
   2. Members who visited country districts during the recent holidays are desired to give brief accounts of their experiences.

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICE.

Subscriptions for 1921-22 are now due. Early payment will be greatly appreciated by the Hon. Treasurer and Committee.

Any change of address should be notified to the Hon. Secretary at once.

The Victorian Naturalist.

Vol. XXXVIII.—No. 10. FEBRUARY 9, 1922. No. 458.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 16th January, 1922.

The president, Mr. F. Chapman, A.L.S., occupied the chair, and about sixty members and visitors were present.

WELCOME.

The chairman welcomed to the meeting Mr. A. H. S. Lucas, M.A., of Sydney, an honorary member of the Club, one of the early presidents of the Society, and the first editor of the *Naturalist*. Mr. Lucas expressed his pleasure at being able to be present at a Club meeting, though naturally he missed many of the faces he was accustomed to see at the early meetings of the Club.

NOTES ON EXHIBITS.

Mr. J. A. Kershaw, F.E.S., drew attention to a collection of plants made by himself during a brief visit to Ooldea, on the Transcontinental Railway, about 350 miles west of Port Augusta, in July last. The species had been determined at the National Herbarium, and particulars will appear in the next *Naturalist*.

Mr. A. J. Tadgell gave some particulars about a series of plants collected during the Christmas holidays in the Victorian Alps, when he was able to add eleven species to the list of the Victorian alpine flora, as well as several introduced plants.

[Mr. Tadgell's remarks appear as an addendum to his paper published in this issue.—Ed. *Vict. Nat.*]

Mr. E. E. Pescott, F.L.S., called attention to his exhibit of a specimen showing the fructification of the fungus *Polyporus mylittæ*, usually known as "Blackfellows' Bread." This stage of the fungus is rarely met with, and for a long time was quite unknown.

PAPER READ.

By Mr. F. Chapman, A.L.S., entitled "Notes on the Geology of the Mallee."

The author, by means of lantern slides, gave an interesting account of the geological formation of the north-western portion of Victoria familiarly known as the Mallee, once a waste of sand and scrub, now one of the leading wheat-producing districts of the State. This change had been brought about mainly by the subterranean exploration carried out in seeking for artesian water, and this water, which had been struck in the majority of the bores, had added increased fertility to the soil and enabled cultivation to take the place of the natural vegetation. The borings revealed the fact that the older rocks

(Metamorphic, Ordovician, and Devonian) were worn down by atmospheric action and river agency to base level in pre-Miocene times. Over the great pene-plain thus formed were spread estuarine mud-flats, with much accumulation of timber and leaves (Banksia and Waratah) from the vicinity. The subsidence was greater than the deposition could cope with, and the sea invaded the land. The general subsidence seems to have been about 100 fathoms in Janjukian times. Then oscillation took place. By erosion and current action the continental shelf was formed, frequented by sharks and crabs (Kalimnan). The coastal geography then assumed variations between shore-line and swamp, making accumulations between 100 and 250 feet thick. These superficial deposits took on the nature of travertin, ironstone, cyprid limestone, estuarine mud with foraminifera, and rolled and wind-worn sand-dune formations.

EXHIBITS.

By Mr. T. S. Hart, M.A.—Blooms of *Epacris microphylla*, from Boronia, near Ferntree Gully, 14th January, 1922.

By Mr. J. A. Kershaw, F.E.S.—Dried plants from Ooldea, South Australia (Transcontinental Railway), collected by exhibitor, July, 1921 : on behalf of National Museum, meteorite from Roper River, Northern Territory.

By Mr. C. Oke.—Spikes of orchid, *Spiranthes australis*, "Austral Ladies' Tresses," from Caulfield—a new locality, and nearest yet recorded to city.

By Mr. E. E. Pescott.—Fungus, *Polyporus mylittæ*, "Blackfellows' Bread," showing fructification ; *Hibiscus Farragel*, F. v. M., collected at Bolton (Mallee) by F. W. Holt, December, 1921, new for Victoria (recorded also from W.A., S.A., N.S.W., Q., and N.T.)

By Mr. A. J. Tadgell.—Forty-one species of alpine plants, from Mounts Feathertop and Hotham, including *Acacia penninervis*, var. *linearis*, Hickory, *Aciphylla glacialis*, Snow Aciphylla, *Astelia alpina*, Astelia, *Helichrysum rosemarinifolium*, var. *ledifolium*, *Olearia flavescens*, Yellowish Aster, *O. subrepandra*, Wrinkled Aster, *Orites lancifolia*, Alpine Orites, *Podocarpus alpina*, Alpine Podocarp, *Trochocarpa pumila*, Dwarf Wheel Heath, *Thamnolia vermicularis* (lichen), *Uncinia compacta*, Mountain Hook Sedge ; living plant of *Nertera depressa*, in berry ; also a micro-fungus, *Fabræa rhytismoides*.

By Mr. H. B. Williamson.—Flowering and fruiting specimens of *Eucalyptus neglecta*, Maiden ; also samples of bark and timber and photographs of tree ; a rare species from Spring Creek, near Cobungra, 18 miles from Omeo, collected by exhibitor, January, 1922. The first specimen brought to Melbourne since its discovery by Mr. A. W. Howitt, F.G.S., in 1882.

After the usual conversazione the meeting terminated.

A CONTRIBUTION TO "THE FLORA OF THE VICTORIAN ALPS."

By ALFRED J. TADGELL.

(*Read before the Field Naturalists' Club of Victoria, 12th Dec., 1921.*)

It was not with any intention of reading a paper before the Field Naturalists' Club of Victoria that I made my collection of Victorian Alpine plants—in fact, I did not expect to make any material additions to the scientific records of species that had been collected by other enthusiasts; nor had I seen the paper by Prof. Ewart entitled "The Flora of the Victorian Alps," accompanied by a botanical report by Mr. J. W. Audas, which appeared in the *Naturalist* for October, 1910 (vol. xxvii., p. 104). I had made my own collection and my own list, which included heights and actual collecting-places, as I had done under similar circumstances in other hunting-grounds. How could I expect to add to the collections of such ardent botanists as the late Baron von Mueller, Messrs. Walter, Stirling, Maiden, French, Barnard, Sutton, and Weindorfer, or, indeed, of so many who had from time to time sent specimens to the National Herbarium?

However, after reading the 1010 list, for the first time, a few months ago, and having had five pleasant outings in the Alps, each extending to about a fortnight, and ranging from early December to the end of March, running up one side of that 40 miles long horseshoe; from Harrietville to the St. Bernard Hospice, diverging to fossick on the steep slopes of Mount Smyth opposite, along and on top of The Twins, thence to Mount Freezeout, then down the valley of the Dargo River, and into the valley called by Mr. Stirling "Flora Valley"; then, resuming the circular bend of that horseshoe route, over windy Mount Blowhard and down the deep valley below it, traversing Mount Hotham in many directions, on its slopes, into Loch Glen, delving into the Diamentina River bed, and backwards and forwards along the Razorback to Mount Feathertop: again, living in solitude at the rest house near the last-named mount on two occasions, continuing down the side of this elephantine monster on its one side, or along its other side, so like one of the Pyramids, and finally down the opposite leg of the giant horseshoe for eight miles into Harrietville—I thought that surely my collection might bear comparison with the 1910 list.

Professor Ewart strongly urged that botanists make full use of the National Herbarium, since alpine collections often yield undiscovered treasures or vary from type. I had already experienced the help and kindness of Mr. J. R. Tovey, the

principal assistant at the Herbarium, so decided to refer and compare the many species I had collected. I therefore gratefully acknowledge my debt to that gentleman and to his able assistants for their trouble, as well as to Dr. R. S. Rogers, of Adelaide, and Mr. J. H. Maiden, of Sydney, for my many references to them.

Our work has been rewarded by increasing the 346 plants recorded in the 1910 list by 83 natives—an increase of over 25 per cent.; by seventeen further varieties; and an addition to the introduced aliens of eleven plants, making a total of 111 additions to the list. Some of the plants in the 1910 list appear as doubtful records, so I have been able to specifically confirm four at least of the rarer ones by actual specimens collected, and to assign to them a definite locality. Places where collected, and heights, are given for all of the plants in my list. The Herbarium has retained most of the additions mentioned in this review, as well as others that were included in the 1910 list, but for many of which no altitude or collecting-ground had been given previously.

I can only reiterate the Professor's hope that the present list will be of use to visitors desiring to botanize amidst the magnificent scenery of the Victorian Alps; and here I may add, for information of at least a few, that one is handicapped by the want of suitable accommodation, for, except an old-fashioned hostelry that did service in the day of the late Baron von Mueller, whose name I found inscribed in the visitors' book, there is no accommodation for another 30 miles than the St. Bernard Hospice, situated about 14 miles from Harrietville, save what the Mount Feathertop rest house affords, or unless sleeping bags are taken.

Of course, the outings one gets in such high altitudes, and under the seasonal and climatic conditions of these alpine regions, have other compensations than botanical ones. In one's retrospects amusement is afforded from one's experiences, to say nothing of the feeling of being right away from one's fellow-beings or of being among great snow accumulations in midsummer, and even frost on Boxing Day (26th December). There is the experience of getting into three thunderstorms in one day; being wet through, and the irony of knowing you are seen by the blind eye given you of a passing motor-car bound for the same destination; yet, though one is dripping wet, one feels too proud to beg a lift. Then there is the being pulled up by a blinding flash, and to hear the simultaneous crash of the heavenly artillery; or, again, of that peculiar sensation in the ears that driving rain gives, as it sizzles against the tree boles and creates a white froth at their bases, the rain meanwhile pouring down on one in one's helpless, unprotected,

and forlorn condition, with still eight miles to walk before one can shelter and get a change of clothing.

If the day be not too hot, as some of you know, the walk from Harrietville to St. Bernard, of fourteen miles, is along a splendid road, that rises—sharply at first—from 1,400 to 5,060 feet, with streams *en route* at which to lave or quench the thirst. Plodding along, with eyes ever on the look-out for botanical prizes, half-way is reached, and one sees at the closing in of the long Ovens Valley, at the river's source, the aptly named Hospice perched aloft, and one's destination for the night, but for a long time it does not appear to come perceptibly nearer. One's eyes light on a beautiful valley of eight or ten miles wide on the left hand, and, beyond it, one sees, like a pencil line in an artist's picture, to-morrow's road, cut out of the mountain crest. This is followed with interest for some five miles or more in the parallel walk on the opposite spur. Ever and anon one's eyes are raised to the skyline to see this pencillar road and Mounts Blowhard, Hotham, and Feathertop. At last the sight of Mount Smyth, like a crouching lion, tells of one's approach to St. Bernard, and one retires to one's room and takes the evening meal in bed, while wet clothes are dried at the kitchen fire. One's wetting is soon forgotten on the following day, for it is "Excelsior!" A belated warning to "hold on to your hat" is received when passing the goose-neck at 5,500 feet at Mount Blowhard, and, as one finds it necessary to go back to pick up the headgear, the lesson is learned why the mountain gets its name.

There is such sublime grandeur on this highest of roads that one never tires of it. It is not until Mount Hotham has been crossed that the road is left, as it falls towards Cobungra and Omeo. To return to St. Bernard, one crosses Hotham as a high plateau (6,100 feet) and rambles over its flat-topped surface and finds the road again, where it crosses the mount on the level at its highest part. Here, on one occasion in December, the remains of a large fire was seen, built by a motor party in the endeavour to melt the snow sufficiently to allow the party to proceed to Omeo. Snow and wood remained for many days after.

There are many rambles to be made over Mount Hotham, which is eight miles from St. Bernard or eight miles from Feathertop—rambles that please lovers of the spectacular in nature quite as much as the scientific botanist. The snow in the distance looks like a flock of dun-coloured sheep, and it remains often till after Christmas and New Year, in large, deep drifts of nearly a quarter of a mile long by a quarter of a mile wide, when not exposed to the wind, giving it the appearance, at a closer view, of a glacier river shooting into the valley below,

while the snow particles tossed up by the walker look like beautiful diamonds in the sunlight. Nor are evidences wanting of the snow having lain long during the winter, as there are numerous barren and coarse stony spaces where the surface soil has been washed away into the valley as the snow melted; yet, where the snow is melting lower down the slopes, the runnels are being transformed into tiny mountain creeklets. Here are to be found many of the gems of the alpine flora. Those of you who have found the Alpine Marsh Marigold, *Caltha introloba*, with its flowers the size of a half-crown or of a five-shilling piece, or the infrequently met with *Astelia alpina*, both of which revel in the melting icy waters, will understand the flower-lover's enthusiasm when these beautiful flowers are met with in their homes.

One is down on hands and knees, then plunging through morasses, then over rocky ravines, now skirting a declivity with uncertain foothold, and later holding on to a grass tussock, so as to draw nearer to some floral treasure. One soon finds oneself unconsciously descending the deep valleys that fall away from Mounts Hotham and Feathertop, and it is hard to resist the temptation of seeking one's treasures further. There is the Alpine Senecio, *Senecio pectinatus*, with its large yellow and beautiful single flowers, so hard to resist, down that awkward slope. One looks up and then down: the hold is precarious. "*Facilis est descensus Averno*," and to slip over that precipice would be easier than to regain the summit. One forgets, in the lure and fascination of these beautiful alpine gems, that one is alone on the mountain side or deep down in the shaded valley, and what a slip might entail.

If so many of the native flowers are rare, the Alps are not without the introduced weeds, and it is surprising what impish delight is felt in cutting deeply into the roots of such as the Common Dock, seen in several places. With Emerson, one thinks of the definition of a weed: so pretty in its place, but so scorned when out of it. On the mountain tops the Common Sorrel is almost as plentiful in places as is the St. John's Wort in the Ovens Valley lower down. There are, however, no rabbits to be seen on the Alps. Hurdle yards of the shepherds remind one of a visit made in the year of the great drought, when impoverished sheep were driven from the Riverina plains to depasture on the exposed mountains. It was no wonder that harsh feed and exposure at an altitude of 5,000 to 6,000 feet resulted in dead sheep almost anywhere, and in an afternoon's walk at least six or seven dying sheep might be counted. Polluting the streams, they doubtless were the means of increasing the number of alien plants: and the crows—how they revelled! Nor do you wonder at the imprecations hurled

at these hideous, white-eyed scavengers as they circled in a flock of over 100 on the summit of Feathertop. One thought of a leg broken and the eight miles from human companionship.

Beautiful sunsets one is able to see almost any day at a low altitude, but the sunrises from Feathertop at 6,306 feet above sea-level are almost incomparable—next only to Kosciusko itself. What is there about the "miracle of the day" that is so awe-inspiring? A lunar eclipse from this height is unique, but it is the sunrise that appeals to the senses. One rises before the lark in preparation for a sunrise, and stumbles over the loose stones in the darkness. There is the patient wait at the cairn, with just a race to be in time, sometimes. The lee side is sought from the cutting wind, which always seems more penetrating at the break of day; and, though one rises in the dark, virtue does not always bring its reward, and a disappointing walk of a mile along the track does not dispel the scud clouds or fog at times, and the masses of mist roll and obscure everything. But one essays again on the morrow, and is compensated by the observation of a glorious mystic lake, with imaginary islands in the storm-tossed sea. One March morning, as the sun rose, the light struck the cairn and projected a dark, uncanny, thin line across the clear valley for 50 miles to and far beyond the Buffaloes. It was like the black shade one sees on a foggy night when standing under a street lamp. As the shadow shortened, and was about to be lost at the foot of the mount, a false sun phenomenon appeared at the point of contact. It was like a sunset throwing its expanding rays for half an hour, but without the rays of light. This atmospheric effect was seen by the observer at a similar height at Kiandra, near Mount Kosciusko, on a previous occasion, but at sunset.

One's experiences as a nature-lover can only be narrated in part, for, standing on Feathertop—almost our highest Victorian mountain—means looking over a world of high mountains, the many successive chains following each other like the waves of the ocean. A fall of snow in March gave zest to an early morning outing. Such an event added the charm of icicle-like flags from the bushes, and a white mantle covering the country around. How fortunate it is that one is not a fauna observer as well as a botanical enthusiast, and so to weary you by setting down what one sees of birds, insects, and animals! It is sufficient to relate to one's fellow-naturalists that the butterfly man would enjoy seeing his fairies floating gracefully on a breezeless day over his head on Feathertop or The Twins at an altitude of 5,000 to 6,000 feet, while his companion, the entomologist, would find a slaty, armour-coated, lazy grasshopper moving amongst the rocks. The bird-lover would make

friends with the Robin-like bird that builds in the doorway of the cabin, and is not disturbed by his passing to and fro; he would talk back to the inquisitive Jay, with his head on one side, who seems to say "Well?" as he stands in the same doorway of the shelter house, with large eyes staring at the intruder. There are great Eagles, floating Hawks, gorgeous Mountain Parrots, Thrushes, Tree-creepers, for the bird enthusiast, and an Owl who perches overhead in the dusk and seems to look ugly at one for daring into his ancient domain. Then Master Reynard, but a few yards away, is there with his fine brush, consuming the remains of one's bully beef, or the mouse and rat caught overnight in one's cabin.

Genuine regret that one's trip must come to a close is experienced after doing fourteen days' solitary, and one would think that to walk along the track, falling from 6,000 to 1,400 feet, down the mountain side would be comparatively easy; but the muscles of one's legs contract most painfully, and seem to knot, necessitating lying full stretch at times, till the Harrietville road is reached and normal conditions again prevail. But how that walk down has been compensated for! At the rest house on Feathertop one had, night and morning, a single Lyre-bird to serenade one, but now there are at least four birds lustily singing at the same time, their clear whistling and mocking notes accompanying one as a last echo from the charms of the bush. Must I forget, in conclusion, the botanist's useful impedimenta, of the ample supply of paper for his specimens, or the inconvenience caused to porter and coachman, and the question, often asked, "Did his travelling bags contain bricks?"—for surely their weight justified the belief.

I subjoin the names, situations, and heights where collected of my additions to the 1910 list. And here again I would say how great is my appreciation of the trouble taken anent my specimens, and all I owe to Messrs. Rogers, Maiden, and Tovey. Mr. Maiden's splendid contributions to the Mount Kosciusko flora made me feel the possibility of finding amongst our alpine plants similar material to that described in his first and second "Contributions."*

Several plants have yet to be definitely determined, and I am hoping to be able shortly to procure further material. For instance, a marsh perennial species of Brachycome, with white flowers, is still in question. Again, the Bristle Grass, *Trisetum subspicatum*, though a very striking grass in the Alps, is confounded with *Calamagrostis quadriseta*, var. *montana*.

* "A Contribution towards the Flora of Mount Kosciusko," by J. H. Maiden, F.L.S., Government Botanist of New South Wales, Department of Agriculture—Miscellaneous Publications, No. 241 (July, 1898); and "A Second Contribution," &c., Mis. Pub., No. 331 (October, 1899).

I have found glabrous as well as pubescent forms, the former appearing to warrant further investigation.

Regarding the orchids, Dr. Rogers, of Adelaide, is characteristically thorough and unboundedly courteous. He examined my more difficult species. A very fleshy form, that I regarded as an alpine form of *Caladenia carnea*, was submitted. Of it he said the labellum has four tows of calli and is devoid of the transverse bars of *carnea*. It has also a wider leaf, and is more hairy. As it does not fit comfortably under any of Fitzgerald's species, or of any other description, for the present it is placed as *Caladenia carnea* var. *quadriseriata*. Of a double-flowering specimen of the same species (being teratological) the Doctor gave a very lucid and full account, and was sufficiently interested to ask if he might retain it. A form of *Prasophyllum Suttoni* was interesting. This species is restricted to our highest mountains, and was collected by Dr. Sutton at the Buffalo Mountains. It is described as a slender white and green species, although the colour was too faded to definitely see its actual colouring at the time Dr. Rogers described it, and it was dry. The lateral sepals are free in the described specimen. I took some notes of the specimens I collected. The plant is robust, its six flowers being distinctly pale reddish, and the lobes are marked with five red lines, except the lower calyx lobes, which are concave and greenish. Even the white petals are red-lined, and this I pointed out to Dr. Rogers. In naming it, the Doctor said that the main criteria of *P. Suttoni* are that it has the petals longer than the lateral sepals, and he pointed out that my specimen differed from the type in the lateral sepals all being connate, and the dorsal sepal longer. As we know, colour is not constant as a determining factor in orchids. For instance, during this past week I had some beautiful spiders, *Caladenia dilatata*, sent to me. Usually the colour of the labellum is rich chocolate, with dark calli on the posterior portion, and few, if any, on the front or curved part. One sent me was a beautiful vieux-rose red on the front, and white posteriorly: the other was yellowish-white entirely. Both had yellow and brown calli, and one had calli on the curved part of the labellum. These colours are most unusual, and result from light, sugar excess, or temperature. A form of *Prasophyllum Frenchi* from the Alps also proved interesting to Dr. Rogers. He was pleased to honour me by associating my name with it. It differed from the usual form, as the lateral sepals were connate, a feature not hitherto observed in the species.

ADDITIONS TO NATURAL ORDERS OF NATIVE PLANTS ON PAGE 110 OF *Vic. Nat.*, Oct., 1910.

Boraginacea, 1; Caprifoliaceæ, 1; Caryophyllaceæ, 3; Cras-

sulaceæ, 1; Compositæ, 16; Cyperaceæ, 9; Epacridaceæ, 3; Euphorbiaceæ, 1; Filices, 2; Geraniaceæ, 2; Gramineæ, 8; Haloragaceæ, 3; Juncaceæ, 1; Labiatæ, 1; Lycopodinæ, 1; Liliaceæ, 1; Leguminosæ, 4; Lichens, 1; Muscæ, 3; Myrtaceæ, 1; Orchidaceæ, 4; Oxalidaceæ, 1; Plantaginaceæ, 2; Proteaceæ, 1; Rosaceæ, 2: Ranunculaceæ, 3; Rubiaceæ, 3; Urticaceæ, 1; Umbelliferæ, 3. Total, 83.

ADDITIONS TO THE LIST OF "THE FLORA OF THE VICTORIAN ALPS" IN THE *Victorian Naturalist* OF OCTOBER, 1910, PAGE 107.

ABBREVIATIONS.

BHARD.	Mt. Blowhard, half-way between St. Bernard and Mt. Hotham.
DARGO TK.	Narrow valley of the Dargo River, behind St. Bernard, towards Freezeout.
FREEZE.	At and towards Mt. Freezeout, 3 miles from St. Bernard Hospice.
FTOP.	Mt. Feathertop, about 8 miles from Harrietville and 15 miles from St. Bernard.
DIAM.	Diamentina or Kiewa River, rising at Mt. Hotham.
HOT.	Mt. Hotham or "Baldy," 7 miles from St. Bernard Hospice.
HVILLE.	Harrietville, about 16 miles from Bright Railway Station.
SMY.	Mt. Smyth opposite and close to St. Bernard Hospice—1 mile.
TWNS.	The Twins Mounts, about 3 miles behind St. Bernard Hospice.
ST. B.	St. Bernard Hospice, about 14 miles from Harrietville.
RAZ. BK.	Razor Back, the long ridge connecting Mt. Hotham with Mt. Feathertop, for about 8 miles.
TO.	Towards.

The limit of alpine flora is taken at 3,000 and over (feet above sea).

The following plants are not included in the *Naturalist* list of October, 1910, and have been collected by A. J. Tadgell during five collecting trips between the months of December and March.

V indicates varieties: * indicates introduced aliens.

Aster (see Olearia).

Ajuga australis.—To. St. B. (3,000 to 4,000), also to. Ftop (4,000 to 5,000 ft.)

Acæna ovina.—Dargo Tk. at 4,000 ft.

Agrostis scabra (distinct from Deyeuxia scabra).—Hot. (6,000), Dargo Tk. (5,000), St. B. (5,000).

A. venusta.—Ftop. (6,100 ft.), also Dargo Tk. (4,500). (Collected also by Walter on Buffalo.)

Asperula scoparia, var. conferta.—Mt. Hot. (6,100), Ftop. (6,300).

*Andropogon halepensis.—Slopes of Feathertop (6,000).

Agropyrum scabrum.—To. Ftop (4,000 to 5,000), Twins (5,500), Dargo (4,500).

Azorella Muelleri.—Hotham (6,100).
Acrotriche serrulata.—Towards Feathertop (2,600 to 4,000).
Brachycome decipiens.—Towards Freezeout (4,500).
B. stricta.—Towards Feathertop (4,000 to 5,050).
Brachycome (nov. sp. ?)—Hotham (6,100).
*v*B. ciliaris, var. robusta. — Twins (5,500), Bhard (6,000), Raz, Bk. (6,000), Ftop. (6,200).
Blechnum (Lomaria) fluviatile.—Dargo Tk. (4,000).
Brutelia affinis (moss).—Ftop. (6,300), Hot. (6,100).
Calamagrostis æmula (Agrostis Solanderi) (Deyeuxia Forsteri). —Dar. Tk. (5,000), St. B. (5,000), Ftop. (6,200).
C. minor, var. densa (Agrostis densa).—To. Ftop. (3,000).
C. nivalis.—Hotham (6,100).
*v*C. rudis, var. contracta (syn. Deyeuxia scabra, var. contracta). —Towards Feathertop (3,000).
*v*Caladenia carnea, var. quadriseriata.—Raz. Bk. (5,600), To. Feathertop (5,000).
Colobanthus Billardieri.—Hot. (6,100), under Ftop. (6,100).
Clematis aristata.—To. St. B. (4,000), to. Ftop. (over 4,000).
*Cerastium vulgatum.—Raz. Bk. (6,100), Ftop. (6,300).
Crassula (Tillea) Sieberiana.—Hot. (6,100), Ftop. (6,300).
Coprosma pumilo.—Diam. (6,000), Hot. (6,050).
Carpha alpina.—Diam. (6,000), Hot. (6,000), Raz. Bk. (6,100), Ftop. (6,300).
Carex Gaudichaudiana (cæspitosa).—Diam. (6,000).
*v*C. Gaudichandiana (dwarf form).—Hotham (6,000).
C. chlorantha.—Hotham (6,000).
C. breviculmis.—Hotham (6,000).
Cyanoglossum australe.—Hotham (6,000).
*v*Danthonia penicillata, var. pilosa.—Smyth (5,050).
*v*D. penicillata, var. pallida.—To. St. B. (3,000).
*v*D. penicillata, var. alpina.—Bhard. (5,800), Hot. (6,100), Ftop. (6,300); syn. D. semiannularis.
*v*D. pauciflora, var. alpina.—Hotham (6,000).
Diuris sulphurea.—Towards Feathertop (4,500).
Didiscus humilis.—Hotham (6,100).
Dichelachne sciurea.—Towards Feathertop (2,600).
Erechtites quadridentata.—Towards Feathertop (4,000).
*v*Euphrasia collina, var. alpina.—Hotham (6,000).
Galium Gaudichaudiana.—To. Ftop. (4,000), Dargo (5,000).
Glyceria dives.—Feathertop (6,000).
Glycine clandestina.—To. St. B. (4,000–5,000).
G. Latrobeana.—Towards St. Bernard (4,000).
Gnaphalium collinum, var. radicans.—Hotham (6,100).
*v*Grevillea australis, var. montana.—Feathertop (6,200).
Geranium (pilosum) dissectum.—To. Hot. (5,100), to. Ftop. (4,000–5,000), Ftop. (6,200).

*v*Helipterum incanum, var. alpina.—Hotham (6,100).
Helichrysum cuneifolium.—Dargo Tk. to. Freezeout (5,000).
H. scorpioides.—To. Ftop. and Hot. (4,000–5,000).
*v*H. rosmarinifolium, var. ledifolium (H. ledifolium).
*v*H. rosmarinifolium, var. intermediate form.
*v*H. rosmarinifolium, var. thyrsoideum.
Haloragis micrantha.—Hotham (6,000).
H. teuchroides.—Dargo Tk. (4,500), Hot. (6,000).
H. depressa.—Dargo Tk. (4,500), Diam. and Hot. (6,000).
Hydrocotyle laxiflora.—Towards Feathertop (5,000).
*Hypochæris radicata.—Ftop. (6,200), to. St. B. (4,000), Raz. Bk. (5,100), to. Ftop. (3,000–5,000).
Juncus prismatocarpus.—Dargo Tk. (4,800).
Lycopodium selago.—Mount Hotham (6,100).
Lomandria (Xerotes) longifolia.—To. St. B. (4,000), to. Ftop. (4,000–5,000).
Leucopogon lanceolatus, var. gelidus.—To. Ftop. (4,000–5,000).
L. Hookeri (differs from Lissanthe (Styphelia) montana).—Feathertop (6,200): collected also by Walter.
Leptorrhynchus squamatus.—Twins (5,500), Bhard (5,500), to. Freeze. (4,000), Hot. (6,000), Raz. Bk. (6,000), to Ftop. (4,000–5,000), Ftop. (6,200).
Leptospermum lanigerum.—To. Freeze. (4,000), to. Ftop. (5,000).
Lomatia Fraseri.—To St. B. (4,000), Dargo Tk. (4,000), to. Ftop. (4,000–5,000).
*Murrubium vulgaris.—Towards St. Bernard (5,000).
*Mentha pulegium.—Towards Feathertop (4,000–5,000).
Microceris Forsteri.—To. Ftop., Twins, Dargo Tk., Bhard., Hot., Raz. Bk., Ftop.
Olearia Frostii.—Dargo Tk. (4,800), Bhard (5,500), Hot. (6,000), Raz. Bk. (6,000), to. Ftop. (5,000), Ftop. (6,200); see also Ewart, Roy. Soc. Proc., March, 1916.
O. flaveseens.—Dargo Tk. (4,500).
O. subrepandra.—Ftop. (5,800).
O. alpicola.—Dargo Tk. (4,500).
Oxalis corniculata.—To. St. B. (4,000), to. Ftop. (5,000).
Oxylobium ellipticum.—To. St. B. (5,000), Twins (5,000), Dargo Tk. (4,800), Bhard. (5,500), Hot. (6,000), Raz. Bk. (6,000), Ftop. (6,200).
*v*Poa cæspitosa, var. latifolium.—Hot. (6,000), Ftop. (4,000–5,050): collected also by Walter.
Pultenæa juniperina, var. planifolia.—To. Ftop. (4,000–5,000); see Williamson's revision also.
*Picris hierachoides.—To. St. B. (4,500), to. Ftop. (4,000).
*v*Pimelea ligustrina, var. hypericina (P. hypericina).—To. St. B. (5,000), Twins (5,000), Dargo Tk. (4,000), Hot. (6,100), to. Ftop. (5,000).

Poranthera microphylla.—To. St. B. (4,000–5,000), Raz. Bk. (5,500), to. Ftop. (4,000-5,000).
Polypodium australe (mountain form).—Hotham (6,100).
Pelargonium australe.—Dargo Tk. to. Freezeout (4,500).
Plantago Tasmanica.—Hotham (6,000), Feathertop (6,200).
P. varia.—Blowhard (5,500).
Polytrichum Sullivani (Moss).—Hotham (6,100).
Parmelia physodes, var. pulverata (Lichen).—Hot (6,100); associated with Scleranthus.
vPodolepis longipedata, var. robusta.—Hotham (6,100), Feathertop (6,200).
Prasophyllum Frenchii, var. Tadgellianum (Rogers).—Hotham (6,000).
P. Suttoni.—Ftop. (6,200): collected also by Dr. Sutton, Buffalo.
P. brevilabre.—To. St. Bernard (4,000).
Ranunculus rivularis.—Dargo Tk. to Freezeout (4,500).
R. hirtus (plebius).—Diam. (6,000).
Rubus parvifolius.—To. St. B. (4,000), Dargo to Freeze. (5,000), to. Ftop. (5,000).
*Rumex acetosella.—Raz. Bk. (6,000), Blowhd. (5,500), to. Ftop. (5,000), Ftop. (6,300).
*R. conglomeratus.—Raz. Bk. (6,000), to. Ftop. (5,000), on Ftop. (6,000).
Senecio velleyoides.—Smyth (5,100).
S. odoratus.—Dargo Track (4,800)
S. lautus.—To. Ftop., Hot., and Twins (5,600).
Spergularia rubra.—Hotham (6,100), Feathertop (6,300).
Sphagnum cymbifolium. (Moss).—Hot. (6,100), Diam. (6,000).
Scirpus cernuus (riparius).—Hotham (6,000).
S. inundatus.—Hotham (6,100), Ftop. (6,200).
S. setaceus.—Diam. (6,000).
S. cartilagineus, var. alpina.—Diam. (6,000).
Sambucus Gaudichaudiana.—To. Ftop. (2,600).
Scleranthus diander.—Raz. Bk. (6,000), Ftop. (6,300).
*Trifolium pratense.—Dargo Track (4,500).
*Trifolium repens.—Bhard. (6,000), to. Hot. (5,000), Ftop. (6,300).
vTrisetum subspicatum (glabrous form).—App. to Ftop. (5,000).
Uncinia compacta.—Hotham (6,100).
*Urtica dioica.—To. St. Bernard (3,000–4,000).
U. incisa.—To. Feathertop (2,600).

The additions are :—

Species (also varieties not recorded)	83
Varieties (of species recorded)	17
Introduced aliens	11
Total	111

It is perhaps unfortunate—but it may have been for economy of space—that the 1910 list appearing in the *Naturalist* does not record heights and localities to guide collectors of the flora of the Victorian Alps, as Mr. Maiden's list of the flora of Mount Kosciusko does, but we may be able at a later date to assist in such a compilation. Mr. Maiden's list commences with plants found at a height of 3,000 feet, but there is nothing to guide us as to a minimum of height in listing our Victorian alpine flora. The ascent of our Alps commences, in my opinion, at about 1,800 feet, or at the Harrietville State school.

In my list of additions I have taken 2,600 as the alpine limit of height, as it is approximately about there that the climatic conditions begin to assert themselves, owing to the proximity of the higher elevations, and it is from there that the rise becomes pronounced towards the higher mountains. My heights to Feathertop were verified by aneroid and with the assistance of the local schoolmaster, Mr. Bennett, while those on the St. Bernard slopes were given me by Mr. Bibby, at that time mine host of the Hospice, and a former road contractor, who would in all probability receive them from the local shire engineer.

SPECIMENS COLLECTED BY A. J. TADGELL, PREVIOUSLY ONLY DOUBTFULLY RECORDED (*vide* WILLIAMSON'S LIST No. 2, *Victorian Naturalist*, vol. xxxvi., p. 18, May, 1919).

Scleranthus muiarioides.—Feathertop, summit (6,300 feet).
Azorella Muelleri.—Hotham (6,100 feet).
Oreomyrrhis pulvinifica.—Hotham (6,100 feet), Diamentina (6,000 feet).
Lycopodium selago.—Hotham (6,000 feet): collected also on Baw Baw—National Herbarium.

ADDENDUM.—Since reading the foregoing paper I had another opportunity of securing specimens of our alpine plants and making a few additional notes as to habits, &c. During the Christmas holidays Mr. A. G. Hooke, of this Club, accompanied me from Bright to Mount Feathertop and along the Razor Back to Mount Hotham, Mr. Hooke continuing to the St. Bernard Hospice and over Mount Freezeout to Treasure's run, on the Dargo High Plains, a further distance of about thirty miles. He secured a fine series of photographs illustrating the grandeur of the scenery of this portion of Victoria. In our numerous excursions we were very much struck with the rapid increase of aliens among the alpine plants. At one time stray plants of sorrel, dock, thistles, or even goosefoot, might be seen here and there, but now acres are taken up by docks, sorrel, flatweed, hogweed, and other lowland stock-brought undesirables. Needless to say, we did a little eradica-

tion where we could. In the 1910 list only eleven aliens were named. I added an equal number in my paper, and now we have added six more, making a total of 28 weeds which have intruded among their alpine congeners; however, it is not the number of species, but the quantity, that hurts. This increase has doubtless been caused by the larger number of sheep and cattle now sent to the alpine heights for sustenance during the summer season. We found the season rather backward on Hotham (6,100 feet), but slightly better on the Razor Back and Feathertop, especially on the western or warm side; but in this region, where a plant runs a quick course, a week or two makes a wonderful change. Thus, by the end of January the Alps would soon fill a botanist's vasculum with rare and beautiful plants and flowers. Among orchids we found the white form resembling *Caladenia carnea* (which Dr. Rogers has since determined as *C. angustata*, previously recorded by Mr. Pescott from Boort, N.W. Victoria, and the Grampians). It occurs on the summit of Hotham, on Feathertop (at 6,200 feet), and also near the rest house (at 5,100 feet), but is not by any means numerous. I had noted it on previous trips, but had regarded it as a variety of *C. carnea*. We also found *Thelymitra aristata*, the Potato Orchid: *Gastrodia sesamoides* (in large numbers), and a Prasophyllum not yet in flower: the latter occurs in quantities on Mount Hotham, growing in lawn-like plots of *Poa cæspitosa*, the leek-like flower-spikes, not yet fully developed, looking like a miniature onion field. We had an echo of the late Baron von Mueller's enthusiasm to Sir Wm. Hooker in 1854, when he discovered that handsome shrub, *Grevillea victoriæ*, which was seen by us at its best. Amongst my exhibits to-night is a living plant of *Nertera depressa*, Banks (*Coprosma nertera*, F. v. M.), which grows only at about 6,000 feet, generally in spongy morasses or near dripping water. A visitor to our hut was so struck with it and its pretty little red fruits that he asked if we had found a tomato. Change of environment, sea-level, and greater warmth have caused this depressed little plant to alter its nature so that the close-set foliage has become elongated, covering both flowers and fruit. Another cushiony, depressed plant found at 6,000 feet was *Hypericum japonicum* (mountain form), a relative of the dreaded St. John's Wort. A micro-fungus found on *Cotula filicula*, an alpine composite, has been identified by Mr. C. C. Brittlebank as *Fabræa rhytismoides*. This gave the host plant quite a fern-like appearance, and not unlike fern-spores on the surfaces of the leaves. The plants exhibited to-night are mostly un-get-at-able species to the ordinary tourist, and are shown as an example of what the alpine flora is like; unfortunately, owing to our meeting being a week later than usual, they are

not in as good condition as I would have wished. In turning over some loose rocks we disturbed thousands of Bogong Moths, *Agrotis infusa*, which made a loud buzzing noise with their wings as they sought another spot in which to shelter. Continuing on towards the summit, a worm-like snake, about twelve inches long and an inch in diameter, was seen. This snake I have seen on several occasions on Mount Hotham, but have never been prepared to bring back a specimen for identification. On arrival at the summit of Feathertop we did an obvious duty in replacing the cairn, which had been demolished, whether by weather or vandals we were not sure; but as the highest point of the double summit of the mount is so difficult to determine at first glance, the cairn should not be allowed to disappear. By this visit we have added the following eleven species to the list of alpine plants, making a grand total of 418 species, with 30 varieties and 28 aliens, all found at over 3,000 feet.

FURTHER ADDITIONS TO THE ALPINE FLORA (FEATHERTOP AND HOTHAM), COLLECTED AT OVER 3,000 FEET, JANUARY, 1922.

NATIVE PLANTS.

vAcacia penninervis, var. linearis.—To. Ftop. (3,500–4,500 ft.)
Caladenia angustata.—To. Ftop. (5,100–6,200).
•Dryopteris punctata, var. rugulosa.—To. Ftop. (5,000).
vHypericum japonicum.—Towards Feathertop (6,000).
Lagenophora Billardieri.—Ftop., ubiquitous to 5,800 feet.
Lepidosperma concavum.—Near rest house, Ftop. (5,100).
Lomandra filiformis.—To. Ftop. (3,000–4,000).
Mentha laxiflora.—To. Ftop. (4,000–5,000).
Plagianthus pulchellus, var. tomentosa.—To. Ftop. (3,500–4,000).
Senecio vagus.—Towards Feathertop (3,500–4,000).
Thamnolia vermicaulis (lichen).—Ftop., near summit (6,200).
Thelymitra aristata.—Towards Feathertop (4,000).
Trochocarpa pumila.—Mt. Hotham (6,000 ft.)

ALIEN PLANTS.

Crepis tectorum.—Towards Feathertop (3,000–4,000).
Poa annua.—Towards Feathertop (5,050).
Polygonum aviculare.—To. Ftop. (5,050), also Raz. Bk. (5,600).
Sonchus oleraceus, var. asper.—To. Ftop. (3,000–4,000).
Taraxacum officinale.—Diamentina (6,000).
Vicia sativa.—Towards Feathertop (5,050).

SUMMARY.

Class.	1910 List.	Tadgell, 1921.	Tadgell, 1922.	Total.
Natives—species	324	83	11	418
,, varieties	11	17	2	30
Aliens	11	11	6	28

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The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

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Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	119
Excursion to Lilydale	122
The Geology of the Mallee. By F. Chapman, A.L.S. ..	124
Ooldea Plants. By J. A. Kershaw, F.E.S.	128
Notes	123, 130

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1922.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 13th MARCH, 1922.

1. Correspondence and Reports.

2. Election of Members.

AS ORDINARY MEMBERS—	PROPOSER.	SECONDER.
Miss M. Sheperd, 175 Hotham Street, East Melbourne.	Mr. A. E. Keep.	Mr. C. Oke.
Mr. Alan Allaway, Leeds Street, Footscray.	Mr. F. Chapman, A.L.S.	Mr. C. Oke.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

   1. By Messrs. C. Daley, F.L.S., and H. B. Williamson—"A Trip to the Sources of the Murray River."
   2. Members who visited country districts during the recent holidays are desired to give brief accounts of their experiences.

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICE.

Subscriptions for 1921–22 are now due. Early payment will be greatly appreciated by the Hon. Treasurer and Committee.

Any change of address should be notified to the Hon. Secretary at once.

The Victorian Naturalist.

Vol. XXXVIII.—No. 11. MARCH 9, 1922. No. 459

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 13th February, 1922.

The president, Mr. F. Chapman, A.L.S., occupied the chair, and about fifty members and friends were present.

REPORTS.

A report of the visit to the Zoological Gardens on Saturday, 21st January, was forwarded by Miss R. Currie, who reported a good attendance of members. The director, Mr. D. Le Souëf, C.M.Z.S., was unable to act as leader owing to the excessive heat of the day, but had deputed one of his assistants for the duty. An inspection of the principal birds and animals was made, and much interesting information afforded to the visitors regarding them. The young hippopotamus, the second born in the Gardens, appeared to be thriving in confinement. The feeding of the carnivora was watched with interest. A visit to the giraffe (now about thirteen feet high) gave rise to some interesting questions put to our guide. The Brush Turkey's mound, made entirely by the male bird, was a source of wonderment, and the explanation given of its actions during the incubation of the eggs excited considerable interest. The inspection of the birds, animals, &c., was rather hurried, owing to the heat, and an adjournment was made to the shady lawn at the Curator's residence, where Mr. Le Souëf had kindly provided afternoon tea, which was greatly appreciated. Here Mr. Le Souëf afforded some further information about several of his charges, and then invited his guests to a brief inspection of his private museum, which contains a large collection of natural history specimens and curios of all kinds. The very hearty thanks of the visitors for the extremely interesting afternoon were tendered to Mr. Le Souëf before leaving.

A report of the week-end excursion to Walhalla and Moe on the Foundation Day holiday (28th–30th January) was given by the acting leader, Mr. F. G. A. Barnard, who said that nine members and friends had made the 200-mile journey. Though the time available for rambling was very brief, the scenery of the latter part of the journey was so delightful that none of the party regretted taking the trip. Sunday was spent on the banks of the Thomson, where the typical vegetation of the district, including nearly twenty species of ferns, was seen to advantage. Unfortunately, rain greatly marred this portion of the outing. Returning to Moe on Monday morning, it had been intended to visit the Morwell coal mine, but, rain again setting in, the majority of the party returned to town. How-

ever, the leader and two others risked the chance of the weather clearing up, which it did, and had an interesting afternoon viewing the location of the great electricity works in course of construction at Yalourn, 7½ miles from Moe, and the open cut on the bank of the Latrobe River where a face of eighty feet of brown coal is being mined. The deposit exists below the floor of the cut for a further depth of ninety feet, which will be mined and converted into electric power by the new works and transmitted to Melbourne and other centres for industrial and other purposes. Some examples of imperfectly converted wood were secured, which probably represent a species of Cypress. During the stay at Walhalla the party was greatly indebted to Const. Rawlings, secretary of the local Tourist Association, for guidance and information regarding that one-time phenomenal goldfield, where £2,500,000 worth of gold was taken from the celebrated Long Tunnel mine, now abandoned.

A report of the excursion to Lilydale on Saturday, 11th February, was given by the leader, Mr. F. Chapman, A.L.S., who said that a good party visited Ruddock's Quarry, where, notwithstanding considerable heat, great enthusiasm was shown in securing fossils from the deposit of Yeringian mudstone exposed there. Quite a large number of fossils, representing many distinct forms of animal life, were obtained.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. H. J. Cruickshank, Railway Offices, Spencer-street, Melbourne, was duly elected as an ordinary member, and Mrs. E. A. Tavaré as a country member of the Club.

GENERAL BUSINESS.

The chairman announced that two members of the Club, Mr. J. H. Young, of Meredith, and Mr. Frank S. Smith, of Noorat, had recently passed away. Both had been enthusiastic naturalists, the former being a keen geologist and the latter an ornithologist of wide experience among the birds of the Western District. Unfortunately, neither of them had contributed to the Proceedings of the Club. He also referred to the recent death of Mr. J. F. Mulder, of Geelong, who, as a member of the Geelong Field Naturalists' Club, had been a leading authority on the natural history of Geelong and its surroundings.

On the motion of the chairman, it was decided to send letters of condolence to the relatives of the deceased gentlemen.

The chairman announced that it had been decided to hold an exhibition of specimens, to be open to the general public, in the Athenæum on 20th June next, and desired members to make as fine a show as possible.

PAPER READ.

By Messrs. J. R. Tovey and P. F. Morris, entitled "Notes from the National Herbarium."

The authors described a new Brachycome, *B. Tadgellii*, named after Mr. A. J. Tadgell, of this Club, who had obtained it at Mount Hotham, Victorian Alps, at 6,000 feet above sea-level, on several occasions. They also recorded *Hibiscus Farrangei* as a new Victorian plant, having been found recently in the Mallee, at Bolton, N.W. Victoria; recorded also from all the Australian States.

HOLIDAY NOTES.

Mr. E. Cox gave some account of a fishing trip to the Dargo River, North Gippsland.

EXHIBITS.

By Mr. F. G. A. Barnard.—Partly-carbonized wood from Moe coal mine, probably a species of Cypress.

By Mr. F. Chapman, A.L.S.—Yeringian fossils, from Lilydale excursion (see report in this issue).

By Master J. Pescott.—Portion of fossil Trilobite, *Goldius Greenii*, obtained at Ruddock's Quarry, near Lilydale.

By Mr. J. Searle.—Exhibited under microscope.—A rare flea, probably *Echidnophaga ambulans*, Oliff, taken on a Porcupine Ant-eater, *Echidna histrix*, at Bairnsdale, by Mr. David Williams. The only other specimens known are in the Australian Museum, Sydney, having been taken in that State.

By Mr. A. L. Scott.—Fossiliferous rocks from Kangaroo Island, S.A.; schist from Second Valley, S.A.; and gneiss and pegmatite from Broken Hill, N.S.W.

By Dr. C. S. Sutton.—Photographs of plants and plant-formations from Cradle Mountain, Tasmania, and specimens of the four cushion plants from same locality—viz., *Raoulia Meredithæ*, *Pterygopappus Lawrencii*, *Donatia novæ-zealandiæ*, and *Dracophyllum minimum*: also yellow specimen of *Blandfordia marginata*.

By Mr. H. Whitmore.—Altered mudstone from Long Tunnel mine, Walhalla; fruit of *Lagenaria Patersoni*, from North Queensland.

By Messrs. Tovey and Morris, on behalf of National Herbarium.—*Brachycome Tadgellii*, Tovey and Morris, sp. nov., from Mount Hotham, Victorian Alps (6,000 feet), collected by Mr. A. J. Tadgell, and *Conospermum amanum*, Meissm., from Western Australia, in illustration of paper.

By Mr. H. B. Williamson.—Dried specimen of *Onopordon acanthium*, L., the Heraldic Scotch Thistle, collected at Omeo by exhibitor, January, 1922.

After the usual conversazione the meeting terminated.

EXCURSION TO LILYDALE.

SEVENTEEN members and friends availed themselves, on Saturday, 11th February, of the opportunity of visiting Ruddock's Quarry, near Lilydale, one of the best localities for Yeringian fossils near Melbourne. Despite the prediction of a hot day, which was fulfilled to the letter, the excursion was enjoyed by all, and in a measure due to the kindness of Mr. S. R. Mitchell, who, with his car, helped several members along the three Irish miles between the station and the quarry. It was noticed with sorrow that a short cut across the last paddock was entirely spoilt from our point of view by having been ploughed into deep furrows. The song of the hammer was soon audible, and the leader had nothing to regret regarding the enthusiasm of the members. Specimens were named on the spot, and it is safe to say that in a few cases, at least, they were also forgotten on the spot. Amongst the corals the rugose, conical form of *Streptelasma* was found more than once; the genus *Romingeria* turned up in some abundance, a form almost restricted to North America; the curious little parasitic *Pleurodictyum*, an aberrant, tabulate form, also occurred. Worms were represented by the tube-building *Trachyderma*, whose soft gill-plumes have been found at Keilor and South Yarra. Crinoid stems were very abundant, usually preserved as limonitic casts and moulds. Some of the slender forms here found seem related to *Myelocrinus*, with its remarkably twisted and coiled stem; whilst the thicker stems resemble those of the *Taxocrinus* type, but may well be any other genus having closely-set stem-joints of considerable width. An aberrant thickening in one crinoid stem seemed to indicate a kind of "gout" produced by a parasite. Brachiopods, or lamp-shells, were found by the score. Amongst the genera noticed were *Stropheodonta*, with its toothed hinge-line; *Chonetes*, with tubular spines on the ventral border; *Orthis*, with cosmopolitan species; the little obese *Gypidula*; the crispate and sulcate *Spirifer*; and the hairy *Nucleospira*. Of bivalves we saw *Paracyclas*, with its delicate concentric ornament, and the curiously-keeled *Mytilarca*. The gasteropods found were the screw-like *Loxonema*; the ornate *Cyclonema*, a genus also found at Cave Hill; and the operculated *Hyolithes*. Amongst cephalopods, *Cycloceras* and *Orthoceras* were noted. In regard to trilobites, we were not so fortunate as usual, the only representative, a tail of *Goldius Greenii*, having been found by one of the younger members. A short address, alluding to the past history of this highly fossiliferous mudstone deposit, was given by the leader, who pointed out its relationships to similar occurrences in North America, England (Shropshire), and Scandinavia (Island of Gotland). Reasons were given for the conclusion that several of our Victorian Silurian fossils

indicate that the palæozoic mud-line of the old Australian continent was the primal home of widely-distributed life-forms. After boiling the billy by the wayside, the return to Lilydale was made, and an agreeable hour was passed over the tea-table at the township, the 7.55 train being caught for home.

F. CHAPMAN.

THE LATE MR. JAMES HAY YOUNG.—The late Mr. Young was a resident of Meredith, and was elected as a country member of this Club in May, 1916. He was an ardent naturalist for the greater part of his life. His attention was first directed to the collection of geological specimens and freshwater shells by the late Mr. Sowerby, a scion of the famous family of English conchologists, and was then about twelve years of age. He had come to Australia from his native town of Kilmarnock, Scotland, at the age of one, about 67 years ago. By exchanging with many of the leading museums Mr. Young gathered together a valuable reference collection. He was most generous with his rare or unique specimens, always being anxious to present them to the National Museum. One of these fossil specimens, an interesting palæozoic worm, was donated, and named after its discoverer, *Cornulites Youngi*. Many rare fossils from the Victorian Tertiaries were also placed in the Museum collection, and one of these, *Plicatula Youngi*, will shortly be described By Mr. Young's discovery of a curious limestone replaced by ironstone, a typical Miocene fauna was shown to exist on the Mornington Peninsula, and this helped to fix the age of the lower ironstone series. One greatly admires the intelligence and kindly disposition of our late friend, who, in the face of many rebuffs in life, pursued his even course of pleasurable geological work, and left a fine record of perseverance and success in his favourite studies.—F. C.

THE LATE MR. FRANK SPENCER SMITH.—Mr. F. S. Smith, who passed away on the 4th February, at the age of 52, was elected a country member of the Club in April, 1914. He was then a resident of Noorat, in the Western District, where he was recognized as an enthusiastic ornithologist. His love of nature, and especially of birds, was followed up under circumstances which to many persons would have been insurmountable. He had been stricken with paralysis at an early age, and all his outings were made in a pony phaeton. For years he contributed a fortnightly column, entitled "Bush Notes by F.R.," to the *Australasian*, and had readers and correspondents all over the continent, but few were aware of the disabilities under which he wrote. His knowledge of Western District birds was very extensive, and if a selection of his writings were published it would doubtless have a ready sale. Though a member of the Club for so many years, he never contributed to its Proceedings.

THE GEOLOGY OF THE MALLEE.

By F. CHAPMAN, A.L.S., Palæontologist, National Museum, Melbourne.

(*Read before the Field Naturalists' Club of Victoria, 16th Jan., 1922.*)

The Fertile Mallee.—About thirty years ago the Mallee area of Victoria was chiefly inhabited by dingoes and rabbits. To-day it is the third largest wheat-producing area in Victoria. The yield per acre is variable, owing to the uncertain rainfall, but averages about eight and a half bushels per acre. In 1917 it ran as high as 12 bushels to the acre.

Seeing that the wheat yield is largely dependent on rainfall and other water supply, the question of artesian or sub-artesian water is one of vital interest to the farmer in the Mallee; and the factors determining these conditions are mainly geological. Although much of the good work has been carried out up to the present with great success by the Commissioners for Water Supply and Mr. A. S. Kenyon, there is still greater scope for their activities in the future. It is interesting to note that, speaking of Victoria as a whole, in 1919 there were 103 Government bores put down, 100 of which struck fresh water at depths varying between 150 and 700 feet. The water rose from 200 to 7 feet below the surface, and in three cases the water was artesian, and rose 4 feet to 17 feet above the surface.

The Geological Aspect of Water Supply.—The explanation of the underground conditions regulating water supply is obviously a geological question, for we must know the underlying geology before we can be certain of striking a favourable area, unless, of course, we are contented with haphazard "stabbing"—a term applied to the methods of many so-called "oil-finders." And not only are general geological principles involved in the favourable location of water bores, but there is also the palæontological side, since fossils are an index of age and superposition of the strata. Thus, for example, an engineer from New South Wales was recently making inquiries in Melbourne as to the prospects of striking water in a partly-worked bore, bringing with him a few shells from the lowest bed struck. These shells, when examined by an expert in fossils, proclaimed the exact position with regard to the water-bearing strata, and he went on his way, like the enlightened eunuch, rejoicing. So much for the "cranks" who study shells.

In the following cursory sketch of the geology of the Mallee we shall do well to examine it by the Lyellian or kindergarten method, so to speak, of treating the familiar surface first, and then diving beneath that surface for evidence from borings, at the same time making use of comparative evidence from other sources; thus gleaning, by successive steps, some ideas of the

various—and, at first thought, almost incredible—changes which this part of the earth has undergone since the foundation-stones of the older rocks were laid down.

Suffice it now to say, in a word, about these borings, that in this systematic study, probably one of the most detailed yet carried out in regard to any borings, the opportunity was afforded the writer of examining all the material obtained from a series of bores numbering 1–11. These were received in August, 1908, and sytematically studied at the National Museum for a period of nearly eight years.* Under the direction of Mr. A. S. Kenyon, C.E., these bores were made in a straight line, starting from the South Australian border at Pinnaroo, to Kow Plains and beyond, at intervals of two to four miles. The water in these borings was met with at 170–250 feet from the surface, and in most cases rose to within 10 to 70 feet of the surface. The samples of rock were procured by the twist bit or shell auger, and the harder rock by the Victoria percussion drill.

Surface Geology.—The modern accumulations of the Mallee to be seen on the surface are brown loamy sands with rootlets, more or less soapy clays (probably derived from decomposing granite), and ferruginous sands. Deposits formed previously —Pleistocene in age—jut out beyond the surface, such as the pink travertin limestone, ironstone "pan" or concretions, ironshot gravel, and sometimes blocks of fresh-water limestone crowded with the remains of little crustaceans that swarmed in myriads in the old surface lakes. These minute organisms belong to the genus *Cypris*, of a species allied to the living *C. mytiloides*. Besides the above deposits there are the enormous accumulations of gypsum or copi and of rock salt, the latter forming in some of the pink lakes of the district.

Pliocene Deposits.—Sands with red jaspery particles and pebbles of hornstone or lydite, and even old sand-dune formations, were met with. In some of the bores estuarine accumulations were noticed, which indicate the proximity of tidal waters. These brackish water-beds were often crowded with countless numbers of the shells of Foraminifera, such as *Rotalia beccarii*, an accompanying fossil in many sinking estuarine areas, and not unknown as the source of oil in the Caspian Basin.

Lower Pliocene to Upper Miocene.—A blue clay-band was present in most of the bores, which is full of sea-shells of a fairly shallow water habitat. This bed, probably extending through the greater part of the Mallee, tends to hold up the brackish water on account of its impervious character. Oft-

* See "Cainozoic Geology of the Mallee and other Victorian Bores," F. Chapman, Rec. Geol. Surv. Vict., vol. iii., pt. 4. 1916.

times beneath this lies a sandy deposit full of tiny little casts of shells, in a substance called glauconite. This is a bluish-green to brown deposit of hydrous silicate of iron, alumina, and potash, found infilling the tests of Foraminifera. It generally indicates current action in the locality of deposition, with a fair depth of water. It is often associated—as, indeed, in this case—with the remains of whales, sharks, and crabs, and this accumulation often results in the formation of valuable deposits of rock phosphate.

With regard to the soil contents and deficiency of phosphoric acid in Victorian soils, the writer holds a theory, well supported by facts, that the Mallee's shortage in this respect is probably due to long sealing-up of the underground supply usually found in Tertiary districts. On the other hand, in England and elsewhere, the crustal rocks are more irregularly broken up, chessboard fashion, so that somewhere or other these phosphate-bearing rocks have been subjected to meteoric weathering, hence the higher percentage of this necessary substance in the soil. We may further assume that by using the water obtained from the deeper strata gradual improvement may be looked for in our subsoils, notably in the Mallee district, for the underlying enriched beds must part with a certain amount of soluble material. Time will prove whether my theory is correct. Capillarity, by the sun's rays, is doing a good deal in producing soil circulation, but sub-artesian water-boring may do still more.

In these impervious deposits in the Mallee the brackish water is held up. The true water-bearing strata are those described below.

Miocene.—The middle or major portion of the Cainozoic series deposited in and around the Murray Gulf, and extending over the Eucla Basin to the Nullarbor Plain and Albany, belong to the important series known as Tethyan, found along the ancient Mediterranean belt, from the West Indies through Southern Europe, India, Java, and New Guinea. This belt branches off to Japan and New Zealand respectively, and also winds round to Southern Australia. In this geosyncline most of the Tertiary oil-fields are found.

In the case of the Murray Gulf, alas! the rich polyzoal beds, replete in animal remains, seem to have suffered rapid decay by bacterial action, or perhaps the deposit, being porous, was ever open to their inroads.

In this polyzoal series flints are found, which in every way resemble the European chalk flints, excepting that they are younger in age.

These beds constitute the true water-bearing strata of the Mallee, and are the vehicle of the subterranean stream by

which an enormous amount of water is lost to Australia in the Southern Ocean.

Basal Miocene.—Beneath these polyzoal beds there is evidence in many parts, as in the outcrops at Anglesea, Victoria, in the bores at Moorlands, in South Australia, and at Tiega and Yatpool, in Victoria, of old estuarine deposits, in places filled with leaves and woody *débris*, forming lignite, which represents a base-levelled country filling up the underlying crags of older rocks belonging to the Lower and Upper Palæozoic and the Mesozoic, the slates and the lake sandstones of the earlier geological history of Victoria. The Tiega bore shows 274 feet of the lignitic beds.

Bed Rock.—There appear to be only two records in Victoria of basal rocks older than Tertiary—at Nhill, where "bed-rock" was struck at 1,172 feet, and Netherby, where "porphyry" was found between 2,175 and 2,200 feet. This latter rock may be comparable with the quartz porphyry of the Grange Burn, Hamilton, which has been regarded as of Lower Devonian age.

Potentialities.—The economic resources of the rocks underlying the Mallee must be enormous, judging from data obtained in the past, and until a systematic survey of a few deep trial bores is made very little progress can be predicted on that scientific basis which is so much needed at the present time.

SUMMARY OF ANCIENT MALLEE GEOGRAPHY.—The Mallee area in early Tertiary times was part of a great river-sculptured plain, into the lower regions of which the vegetable *débris* was washed. Local lignite fields in the Miocene point to the existence of certain parts of the country which were then dominated by a rich and luxuriant growth of timber and scrub. The genera of plants found show that there was a sandy drift already developed in these and adjacent parts, as witnessed by the remains of the Native Honeysuckle (*Banksia*). Other plant remains go to prove that the climate was a little warmer than at present—that is, warm temperate. Evidence of plant accumulation about this time is also strong in the Anglesea district, where the land surface was becoming unstable and allowing inroads of the sea; consequently shallow-water deposits were formed containing foraminifera like *Cyclammina*, a shell also found associated with the carbonaceous beds of the Mallee.

After this episode there was a gradual subsidence of the Mallee area, together with that part of the country to the south of the "Dundas Peninsula," known as the "Great Valley of Victoria." Into this subsiding region flowed the deep sea,

forming the "Murray Gulf," where polyzoa lived that indicate at least 100 and sometimes as much as 600 fathoms. In this sea swam strange sharks and toothed whales, as well as larger developments of the well-known fishes of to-day. After as much as 600 to 2,000 feet of chalky limestone had been accumulated, the sea-bed seems to have gradually been on the up grade, becoming shallower and more subjected to currents, as shown by the quantity of greensand formed in these marine muds. This was in Lower Pliocene times. Following upon this, the land gradually emerged from the sea, and dune, lake, and swamp prevailed. Much of the material is wind-worn, showing a certain amount of desert condition. Evidence is not wanting that there was, even in Older Pleistocene times, a fairly copious rainfall, the water circulating in the layers above the Kalimnan marine beds that acted as an impenetrable floor to the old gulf. This underground water supply was brought up by capillarity, and the minerals, as gypsum, salt, limestone, and ferruginous deposits, were left as intercalated or superposed encrustations as we see them on the surface at the present day.

[The paper was illustrated by a fine series of lantern slides.—ED. *Vict. Nat.*]

OOLDEA PLANTS.

By J. A. KERSHAW, F.E.S.

DURING a visit to Ooldea, on the Transcontinental Railway, about 350 miles west of Port Augusta, in July last, I took the opportunity to collect a number of the more conspicuous plants and shrubs found within a radius of about seven miles of the station, but no systematic plant collection was attempted. The locality is almost on the eastern edge of the Nullarbor Plains, and consists of sand-hills with very sparse vegetation. The specimens have been kindly identified for me by Mr. J. R. Tovey, of the National Herbarium, and it was thought that the publication of the full list might be of advantage to some student of the flora of that portion of South Australia. The list is as follows:—

ACACIA ANEURA, F. v. M., Common Mulga.—Two forms—one with broad and the other with narrow, cylindrical phyllodes.

ACACIA LIGULATA, A. Cunn.—A long, narrow-leaved Acacia, in full flower.

ACACIA RANDELLIANA.—Common form. Beautifully-shaped trees, from 6 to 8 feet high, and in full flower.

ACACIA RANDELLIANA, W. V. Fitzg.—A form with almost cylindrical phyllodes and bright yellow flowers.

ACACIA RIGENS, A. Cunn.—Locally known as "Dead Finish," because of its dense needle-like leaves. Very common.

ADRIANA HOOKERI, Mueller, "Water-bush."—A shrub about 3 feet high. Only seen near Ooldea Soak, and said to indicate the presence of water.

ATRIPLEX SPONGIOSUM, F. v. M., Spongy Salt-bush.—Very small plants, growing plentifully on edge of a dry salt lake near Ooldea Soak.

BASSIA SCLEROLÆNOIDES, F. v. M., Woolly-fruit Salt-bush.—Common on Nullarbor Plain. Said to have a certain fodder value.

CALANDRINIA POLYANDRA, Benth., Parakeelya. Common in sand-hill country, with small white flowers.

CALOTIS MULTICAULIS, Black, Feather Burdaisy.

CASSIA ARTEMISIOIDES, Gaud., Wormwood Cassia.

CASSIA EREMOPHILA, Cunn., var. PLATYPODA. In full flower.

CASSIA STURTII, R. Br., Dense Cassia.

CEPHALIPTERUM DRUMMONDII, A. Gray.—This everlasting was extremely common on sheltered flats between the sand-hills, and made a pleasing picture.

EREMOPHILA ALTERNIFOLIA, R. Br.—In sand-hills, about 6 feet high, in full flower.

EREMOPHILA LATROBEI, F. v. M.—Plentiful around Ooldea; 4 to 5 feet high.

EUCALYPTUS INCRASSATA, Lab., var. GONIANTHA.—Common among sand-hills.

EUCALYPTUS PYRIFORMIS, Turcz.—Isolated patches among sand-hills, growing about 20 feet high, and laden with clusters of huge seed-pods. Flowers about 2 inches in diameter, in two colours—crimson and creamy-white.

EUCALYPTUS TRANSCONTINENTALIS, Maiden, Grey Mallee.—Common among sand-hills, in flower.

FUSANUS ACUMINATUS, R. Br., "Native Peach" or Quandong.—Very numerous in sand-hills. Well-shaped bushes laden with fruit.

FUSANUS SPICATUS, R. Br., Sandalwood.—Common in places, but of stunted growth, and laden with small, round fruit.

GOODENIA PINNATIFIDA, Schlech., Cut-leaf Goodenia.—Very plentiful among Blue-bush and Salt-bush on Nullarbor Plain.

GREVILLEA STENOBOTRYA, F. v. M., Beefwood-tree.—Fifteen to twenty feet high, with flattened seed-pods. Only seen in sand-hills near Ooldea Soak.

GYROSTEMON RAMULOSUS, Desf., "Christmas Bush."—Twelve to fifteen feet high. Only found in sand-hills near Ooldea Soak. Wood soft, very brittle, and extremely light in weight when dry. Mr. Tovey remarks:—"This plant was

looked upon by Giles, Warburton, and other explorers as being poisonous or highly injurious to their camels. So far as we know, no poisonous properties have been extracted from the plant."

HELICHRYSUM LAWRENCELLA, Lindl., var. DAVENPORTII, F. v. M.

HELIPTERUM ROSEUM, Benth., var. PATENS (Ewart), Black.

KOCHIA SEDIFOLIA, F. v. M., Dense Blue-bush.—Characteristic of the great plain, and has a fodder value.

KOCHIA TRIPTERA, Benth., var. ERIOCLADA, Benth.—On sandy patches near Ooldea. Stated to appear only after heavy rains.

LEPIDIUM ROTUNDUM, D. C., Veined Pepper Cress.

LEPTOSPERMUM LÆVIGATUM, F. v. M., Coast Tea-tree.—Common in sand-hills.

LORANTHUS EXOCARPI, Behr., on *Acacia rigens*, and laden with small, bright red fruit.

LORANTHUS PENDULUS, Sieb., Hanging Mistletoe.—Common on Grey Mallee.

MELALEUCA PARVIFLORA, Lindl., "Moonah" (native name "Wilvillah").—Collected near Ooldea Soak.

MINURIA LEPTOPHYLLA, D. C., Silky Minuria.

OLEARIA MUELLERI, Benth., Dusky Daisy Bush.

PITTOSPORUM PHILLYRÆOIDES, D. C., "Weeping Pittosporum."—On Nullarbor Plain, about 6 feet high.

SALICORNIA AUSTRALIS, Banks and Sol., Beaded Samphire.—Edge of dry salt lake near Ooldea Soak.

SENECIO GREGORII, F. v. M., Fleshy Groundsel.—Only a few of these bright yellow flowers were seen.

SISYMBRIUM ORIENTALE, L., Indian Hedge Mustard.—An introduced plant.

SWAINSONA LESSERTIIFOLIA, D. C., Purple Swainsona.—In flower on Nullarbor Plain, near Watson.

WAITZIA ACUMINATA, Steetz, Orange Immortelle.—A very striking yellow everlasting, not found commonly around Ooldea.

ZYGOPHYLLUM FRUTICULOSUM, D. C., "Shrubby Twinleaf."—Isolated patches on edge of sand-hill country.

"VIEWS OF THE GRAMPIANS."—A recently-issued collection of pictures illustrating scenes at the Grampians, one of our most popular tourist resorts, will be handy for sending to friends abroad to show them that Victoria is not behind other countries in its scenic beauties. Mr. E. E. Pescott, F.L.S., has contributed a short introduction, in which he touches on some of the wild-flowers and beauty spots of the district. Most of the pictures are from views taken by the late Mr. A. J. Relph, well known for his enthusiasm about the Grampians.

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The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

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Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	131
Book Notices	133
Notes from the National Herbarium of Victoria, including a Description of a New Species of Brachycome. (With Plate.) By J. R. Tovey and P. F. Morris ..	135
Notes	137, 138
The Late Mr. J. F. Mulder	138

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1922.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 10th APRIL, 1922.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Miss G. E. Davis, Elsternwick.	Mr. E. E. Pescott, F.L.S.	Miss Cruickshank.
Miss P. J. Griffiths, B.A., 27 Grosvenor Street, Middle Brighton.	Mr. W. F. Gates.	G. Coghill.
Miss Margt. Guest, 245 Latrobe Street, City.	Mr. W. F. Gates.	G. Coghill.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

   1. By Dr. G. Horne, V.D.—"Aboriginal Scrapers."

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICE.

The Club year ends with the current month. Any unpaid subscriptions should be forwarded to the Hon. Treasurer **at once.**

Any change of address should be notified to the Hon. Secretary at once.

The Victorian Naturalist.

Vol. XXXVIII.—No. 12. APRIL 6, 1922. No. 460.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 13th March, 1922.

The president, Mr. F. Chapman, A.L.S., occupied the chair, and about sixty members and visitors were present.

CORRESPONDENCE.

From Miss Florence Smith, acknowledging, on behalf of her father, brothers, and sisters, the Club's message of sympathy on the death of her brother, Mr. Frank S. Smith.

From Tasmanian Field Naturalists' Club, inviting members to take part in the Easter camp-out at Adventure Bay, Bruni Island.

REPORTS.

A report of the excursion to Black Rock on Saturday, 20th February, was given by Mr. J. Stickland, who acted as leader in the unavoidable absence of the appointed leaders, Messrs. J. Shepherd and J. Searle. He reported a good attendance of members. The tide, unfortunately, was not suitable for extensive collecting. However, an interesting afternoon was spent, and much information relating to the common objects found on the seashore was exchanged.

A report of the visit to the Enid Nursery, Ivanhoe, on Saturday, 11th March, was given by the leader, Mr. E. E. Pescott, F.L.S., who said that a large party of members attended. The members were conducted through the greater part of the nursery by the proprietor, Mr. G. M. Duncan, who is an enthusiast regarding the growing of native shrubs and trees. It came as a surprise to members to see about 20,000 Australian trees and shrubs, &c., in pots ready for sale; naturally, eucalypts and acacias bulk largely in these figures, some thirty species of the former and seventy-five of the latter being included in the plants grown. Many rare Australian specimens were seen in various stages of growth, among them the rare palm, *Livistona mariæ*, F. v. M., from the Macdonnell Ranges, Central Australia, its only habitat, remarkable for the red colour of its leaves. The party had been entertained at afternoon tea by Mr. Duncan, and, before leaving, the president, Mr. F. Chapman, expressed the pleasure of the members at the great revelation to them of the enterprise of Mr. Duncan in his efforts to popularize native vegetation.

On the motion of Messrs. Pescott and Barnard a vote of thanks was directed to be forwarded to Mr. Duncan for his

kindness in allowing a visit to be made to the nursery and for his hospitality.

ELECTION OF MEMBERS.

On a ballot being taken, Miss M. Sheperd, 175 Hotham-street, East Melbourne, and Mr. Alan Allaway, Leeds-street, Footscray, were duly elected members of the Club.

GENERAL BUSINESS.

Mr. C. L. Barrett, C.M.Z.S., referred to the proposal of the Fisheries and Game Department to allow shooting of ducks, &c., for market purposes during the close season: He moved that a letter of protest be sent to the Department, which was seconded by Mr. E. E. Pescott, F.L.S., and carried unanimously.

PAPER READ.

By Messrs. C. Dalcy, F.L.S., and H. B. Williamson, entitled "A Trip to the Sources of the Murray River."

The geographical and physiographical features of the country between Omeo and Forest Hill were dealt with by Mr. Dalcy, who exhibited a large number of rock and mineral specimens in illustration of his remarks. The botanical results of the trip were commented on by Mr. Williamson, who exhibited about fifty specimens of the rarer alpine plants noticed.

The paper was well illustrated by a large series of photographs.

NATURAL HISTORY NOTE.

Mr. A. J. Tadgell drew attention to a number of marine shells, &c., from Cowes, Phillip Island, and read some notes by Mr. J. A. Kershaw, F.E.S., regarding them.

He also called attention to the remarkable longevity possessed by *Lobelia simplicicaulis* after being picked, the specimens exhibited having been collected on 31st January, and were still fresh, and further flowers expanding, on 13th March.

EXHIBITS.

By Miss Rose Currie.—Kopi, from Cowangie, N.W. Mallee, Victoria.

By Miss K. Currie.—Flowers of Murray Lily, *Crinum pedunculatum*, a native of New South Wales, grown by exhibitor at Lardner, Gippsland.

By Mr. C. Daley, F.L.S.—Rocks and minerals from the Omeo and Cobberas districts in illustration of paper, including Older Basalt from Cobungra, at 5,000 feet above sea-level, and porphyry from the summit of the Cobberas (6,030 feet), black marble from Native Dog Creek, and cassiterite (tinstone) from Glen Wills.

By Mr. J. E. Dixon.—Coleoptera recently collected in Victoria.

By Mr. E. E. Pescott.—Flower of Garland Lily, *Calostemma purpureum*, grown from specimens obtained at Lake Hattah, N.W. Mallee, by Mr. J. E. Dixon.

By Mr. J. Stickland.—Egg-case of a mollusc from Black Rock (portion exhibited under microscope).

By Mrs. E. Tavaré.—Grape-like galls on a leaf of *Eucalyptus pauciflora*, Snow Gum, from Mount St. Bernard, Victorian Alps, the galls being soft, like a grape, and each containing a small brown larva of a hymenopterous (?) insect.

By Mr. A. J. Tadgell.—Marine shells, &c., from Cowes. Specimens of *Lobelia simplicicaulis* in illustration of notes.

By Mr. H. B. Williamson.—Dried specimens of about fifty alpine plants, also photographs in illustration of paper.

After the usual conversazione the meeting terminated.

BOOK NOTICES.

New Zealand Ferns, by H. B. Dobbie. Auckland: Whitcombe and Tombs Ltd. Pp. 394 (5½ x 8½). 160 plates. 35/-.

In this handsomely-produced volume, which, the author says, has "no pretension to being a scientific work," the whole of the recorded ferns of New Zealand are dealt with in a popular way, written so that the merest tyro can understand. That the author is an enthusiastic lover and grower of ferns is seen in every page. Every species and all well-marked varieties are illustrated by direct photographs from selected typical specimens, the size of the original being given in every case. In addition, with regard to many species, enlarged drawings are given of the position of sori or spore-cases on the fronds, so as to help in the identification of species. The author prefaces his descriptions with a few notes on the cultivation of ferns, and to a non-resident of New Zealand it seems that Auckland must possess an ideal climate for fern-growing, for no less than twenty species appeared as self-sown plants in the author's fernery. This, by the way, seems to have been constructed of tufa blocks in terraces, on which the ferns grew luxuriantly. He gives the total number of New Zealand ferns as 134 species and 24 well-authenticated varieties belonging to 34 genera, of which 44 species and 13 varieties are found only in New Zealand. The majority of the species are common to both islands, but the North Island has 17 species and 3 varieties not found in the South, which has only three endemic species. The islands off the coast possess eight species

and three varieties not found on the mainland. Of the species recorded, about 38 are also found in Victoria and several others in Tasmania, New South Wales, and Queensland, while, of course, others extend to other parts of the world. The ferns of New Zealand contain many handsome and graceful species. The genera containing the most species are Hymenophyllum, 19, and 2 varieties; Lomaria, 14, with 1 variety; Asplenium, 12 species and 8 varieties: and Polypodium, 10 species and 3 varieties. The work is a notable addition to the fern literature of the world.

"THE WILD-FLOWERS OF WESTERN AUSTRALIA." By Emily H. Pelloe. Melbourne: C. J. De Garis Publishing House, 1921. 124 pp. (8½ x 11), with 7 coloured plates and illustrations in the text (by the author). 21/-.

Mrs. Pelloe is to be congratulated on having produced a volume which deals with the more striking flowers of that portion of Western Australia south of Shark's Bay in such a manner that the mere flower-lover will be able to follow her remarks, and doubtless derive much information from them. At the same time, the scientific interest of the flowers has not been forgotten, and readers at a distance will be able to get a very good idea of the character of the flora of "Swanland," as Professor Griffith Taylor has termed that portion of our continent. A useful introduction explains the scope of the volume, and in so doing emphasizes many of the fundamental facts of botany. Then four chapters are devoted to a kind of calendar of the flowering times of the flowers dealt with, the year being treated in four sections, January to June—the slack season—forming the first, the remaining six months being in three sections of two months each. By this means a collector can get a very good idea of what his plant may be by noting in which month it was found in bloom. A brief description of each species mentioned appears at the end of each chapter. Then a section is devoted to "Families and Genera," which is more scientific, giving concise descriptions of the various genera mentioned, and a statement of the number of species occurring in each Australian State. An appendix—"Biographical Notes"—follows, containing the names of notable persons after whom the plants have been named by various authorities. A glossary of botanical terms and a very full index complete the volume. Mrs. Pelloe is to be congratulated on her drawings, but in the case of some species the printers have failed to get the right tone in the coloured plates; however, the volume should prove of great service, and were there a volume on similar lines for Victoria it would prove a boon indeed.

PLATE IV.

BRACHYCOME TADGELLII. TOVEY AND MORRIS, sp. nov.

NOTES FROM THE NATIONAL HERBARIUM OF VICTORIA, INCLUDING A DESCRIPTION OF A NEW SPECIES OF BRACHYCOME.

(With Plate.)

By J. R. Tovey and P. F. Morris.

(*Read before the Field Naturalists' Club of Victoria, 13th Feb., 1922.*)

These notes contain—(*a*) a description of a new species of Brachycome from the Victorian Alps: (*b*) a record of *Hibiscus Farragei* as an addition to the list of the native flora of Victoria; (*c*) a supposed new species, *Conospermum suaveolente*, Herbert, is reduced to a synonym of *C. amœnum*, Meissn., there being insufficient specific distinction between them. The remainder are chiefly records of the distribution of plants.

Brachycome Tadgellii, Tovey and Morris, sp. nov.

Herba perenne glaberrima; foliis 2″–5″ longis, polymorphis linearis–integerrimis spathulatis ad crenatis, pinnatisectis. Capitulis magnis; bracteis linearis; acheniis obovatis, oblongis–ellipticiis, non alatis; pappo brevissimo coronatum.

A tufted perennial with creeping rhizomes, 6–12 inches high. Scape with 3 to 5 pinnatifid or entire leaves. Leaves 2–5 inches long, varying from quite entire, spathulate to crenate, lobed, pinnatifid or pinnatisect. Lower leaves fleshy, crowded at the base, spreading, basal leaves decaying. Capitulum large, involucre $\frac{3}{8}$ inch in diameter. Ray florets white, numerous, about 30, much longer than the bracts. Margins of style slightly rough. Bracts linear, slightly margined with purple; achene very variable, from obovate to oblong–ellipsoid, without marginal wing, but having in many cases a glandular pubescence on the edges; tipped with a glandular or bristly pappus half as long as achene.

Mount Hotham, Victoria, 6,000 feet. A. J. Tadgell, December, 1913, December, 1921.

Its nearest affinity is *B. radicans*, from which it differs in having more fleshy, broader, and pinnatisect leaves; the scape bearing 3–5 leaves; the bracts and margins narrower; the achenes without broad crenate margins, and having in many cases a glandular pubescence on the margins.

Explanation of plate—1. Whole plant, about natural size; 2, Disc floret and achene; 3, Ray floret and achene; 4, Bract with margin. 2, 3, and 4 much enlarged.

Hibiscus Farrangei, F. v. M. (Malvaceæ), Frag., viii., 241 (1874).

Bolton, Victoria, F. T. Holt, Jan., 1922 (per Botanic Gardens).

This plant, which was previously recorded from New South

Wales, Queensland, North, South, and Western Australia, has now been found in Victoria, and must therefore be added to the list of Victorian flora.

Conospermum amœnum, Meissn. (syn. *Conospermum suaveolente*, Herbert).

In the *Journ. Roy. Soc. of W.A.*, vii. (1921), Mr. D. A. Herbert described a new species (*C. suaveolente*). He stated that it differed from *C. amœnum*, Meissn., in the longer and more slender terete leaves, the dilated leaf bases in the upper ends of the branches, and the length of the spike. The flowers were axillary along the stem, and do not show the same tendency as in *C. amœnum* to cluster at the top. On examination of the material of *C. amœnum* in the National Herbarium, we find that a specimen (Preiss, No. 745) has the flowering spike just as long as in that of *C. suaveolente*, and has also the dilated leaf bases. The leaves of Drummond's No. 583 are as long and as slender as those of the new species (these two are evidently Meissner's types). There are also intermediate forms showing gradations between the long flowering spike and the ones with the flowers clustered at the top: the leaves are of various lengths, and several with dilated leaf bases. The differences between Mr. Herbert's species and *C. amœnum* are therefore not sufficient to constitute a specific distinction. *C. suaveolente*, Herbert, must therefore be reduced to a synonym of *C. amœnum*, Meissn.

Brachypodium distachyum, Beauv., "False Brome Grass" (Gramineæ).

Preston, Victoria, G. H. F. Baker, November, 1921.

A native of the Mediterranean regions and the Orient. A new locality in Victoria for this grass. it was previously recorded from Dooen, North-West Victoria. It appears to be permanently establishing itself in the Preston district.

Calamagrostis filiformis (Forst.), Pilger (*Avena filiformis*, Forst., 1786), (*Calamagrostis æmula*, Steud., 1821), (*Deyeuxia Forsteri*, Kunth., 1833).

Under the laws of botanical nomenclature, Forster's original specific name has priority over that of Steudel's.

Carduus arvensis, L., "Perennial Thistle" (Compositæ).

Hillend, 18 miles from Moe, Victoria, W. Burrage, January, 1922.

A form with white flowers.

Cyperus vegetus, Willd., "Umbrella Sedge" (Cyperaceæ).

Yannathan, Victoria, R. Poole, December, 1921.

This South American sedge is often grown in gardens, and, thence escaping, it is now growing wild in many parts of Victoria, and may be considered naturalized.

Pelargonium graveolens, L'Herit., "Scented Pelargonium" (Geraniaceæ).

Geranium Springs, Grampians, Victoria, J. W. Audas, December, 1921.

A new locality in Victoria for this South African plant, which is evidently in the process of naturalization.

Phalaris paradoxa, L. (Gramineæ).

Mildura, Victoria, per G. H. F. Baker, November, 1921.

A native of the Mediterranean regions and the Orient. Not previously recorded as growing wild in Victoria.

Potentilla erecta, L., "Erect Potentil" (Rosaceæ).

Warragul, Victoria, P. J. Wolfe, January, 1922.

A native of Europe and Asia, previously recorded in Victoria for the North-Eastern and South-Western districts.

Sesuvium portulacastrum, L. (Aizoaceæ).

Carington's Landing, Macarthur River, Northern Territory, G. F. Hill, No. 591, 20th September, 1911.

This was recorded as *Aizoon zygophylloides*, F. v. M., on page 106 of the "Flora of the Northern Territory," by A. J. Ewart and O. B. Davies, which was apparently an error in identification. There being no authentic specimens of Aizoon from the Northern Territory, the genus Aizoon will therefore have to be deleted from the list of that flora.

MOUNT GAMBIER, S.A.—The recently-issued volume of the *Transactions and Proceedings of the Royal Society of South Australia* (vol. xlv., 1921) contains an interesting paper by Dr. Charles Fenner (D.Sc.), entitled "The Craters and Lakes of Mount Gambier." Like Dr. Fenner's previous work on the Werribee River, the paper is a most comprehensive and informative one, well illustrated with diagrams, maps, and a plate depicting two of the lakes. The author reviews previous writings on the area, and summarizes his conclusions on the origin of the craters and lakes, which are not geologically old. To anyone visiting this interesting district Dr. Fenner's paper should be of great service.

THE LATE MR. J. F. MULDER.

By the death of Mr. John Frederick Mulder, of Geelong, on 27th December last, at the age of 81, Victoria has lost one of her keenest naturalists. Though not a member of the Field Naturalists' Club of Victoria, he was so well known to many of its members that an appreciation of his work in these pages will not be out of place. Mr. Mulder was a native of Kent, England, and arrived in Geelong with his parents when about seven years of age. He seems to have been an observer from his earliest years. In those days aboriginals were not uncommon in the Geelong district, and as a boy he made friends with them, becoming acquainted with their ways and learning about their implements, of which in later years he possessed a fine collection. The birds of the district naturally attracted him, and on taking up the business of a taxidermist he became interested in other forms of Nature. He made collections of the local beetles and butterflies, becoming also an authority on the plants of the district. He also turned his attention to fossils, and *Cypræa Mulderi* was named in his honour by the late Prof. Tate, of Adelaide. With these inclinations he naturally had a wide circle of friends, of whom may be mentioned Baron von Mueller, Dr. T. S. Hall, J. Bracebridge Wilson, John Dennant, and A. B. F. Wilson. When the Geelong Field Naturalists' Club was founded in 1880, shortly after the Melbourne society, he became a prominent member, and was always ready to assist budding naturalists, whatever their leanings might be. He contributed many papers to the Club on a wide range of subjects, which duly appeared in the *Geelong Naturalist*. Of his collections, which were very considerable, the bulk of the fossils are now in the Melbourne Museum, where some new forms will be worked out as opportunity offers. Other portions were purchased by leading citizens of Geelong and presented to the local museum, of which he had been curator for a number of years. That he was a remarkable man is shown by the fact that he found time to act as a bandmaster, and was an adept at almost any instrument. The memory of the good work that he did and the influence he exerted will not readily be forgotten in the district in which he spent so many years of a useful life.

Local Handbooks.—The South Australian branch of the British Service Guild proposes to publish a series of handbooks dealing with the various branches of natural history in that State. Already six have been arranged for. They are to be illustrated, and should fill a long-felt want. Similar series for other States would be of great value.

THE

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OF THE

Field Naturalists' Club of Victoria.

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CONTENTS.

FIELD NATURALISTS' CLUB OF VICTORIA :— PAGE

Annual Report - - - - - 26

Exhibition of Wild-flowers - - 80, 111

Proceedings 1, 13, 25, 41, 55, 67, 77, 97, 109, 127, 149, 161

Reports of Excursions 3, 13, 25, 41, 43, 55, 58, 67, 77, 78, 84, 97, 98, 111, 113, 127, 149, 152

ORIGINAL PAPERS.

AUDAS, J. W., F.L.S.—A Circuit of the Grampians (with map) - - - - - - 87

CHAPMAN, F., A.L.S.—On a Cast of a Fossil Sea-Urchin from the Red Sands of Studley Park, Kew (with plate) - - - - - 158

COLEMAN, MRS. E.—Some Autumn Orchids - - 103

DALEY, C., B.A., F.L.S., AND WILLIAMSON, H. B., F.L.S.—Where the Murray Rises - - 4, 17

DAVEY, H. W., F.E.S.—The Introduction and Spread of Noxious Weeds - - - - 50

HARDY, A. D.—The Measuring of Tall Trees (with plate) - 166

HORNE, DR. GEO., V.D.—Aboriginal Implements (with figures) - - - - - 63

MACGILLIVRAY, DR. W.—A Trip to the North and North-West of Broken Hill (with map) - - 131

MORRISON, P. C.—A Simple Study of Our Common Serpulid - - - - - 70

OKE, CHAS.—An Entomologist in the Dandenongs in Winter - - - - - 116

INDEX.

PAGE

Aboriginal Scrapers - - 1
Acrotriche fasciculiflora, F. v. M. - - - 44
Alectoria superba - - 151
Alphington, Excursion to 77
Alpine Flowers - - 162
Alpine Orchids . - 176
Ants and Termites - - 40
Apotrechus unicolor - - 137
Audas, J. W., F.L.S.—Circuit of Grampians 56, 87
Austral Avian Record - 54
"Australian Bird Maps" 76
Australian Museum Magazine - - - - 95
Australian National Research Council - - 40
"Australian Nature Studies" 96
Australian Rotifers - 40
Australian Science Abstracts 165
Bayswater, Excursion to 67
Beetles, Destructive - 129
Belgrave - - - - 128
Bendigo, Excursion to 67, 84
Bendigo Plants - - 86
Biology School, University, Visit to - - - - 55
Birds of Omeo District - 23
Blackburn, Excursion to 77
Bogong, Flowers from - 151
Bogong High Plains - - 128
Bogong Plants - - 176
Borthwick, The late Mr. A. - - - 99, 102
Botanical Gardens, Excursion to - 111, 149
Botany of Cobberas, &c. - 20
Broken Hill, Trip to North and North-West from 99, 131
Butterfly, A Rare - - 2
Carex pyrenaica, var. *cephalotes* - - - 162
Chapman, F., A.L.S.—Cast of Sea-Urchin from Studley Park - - 127
Chapman, F., A.L.S.—Concretionary Nodules - 163

PAGE

Chapman, F., A.L.S. — Presidential Address 31
Cheltenham, Excursion to 77
Children's Hospital, Life Members Appointed - 111
Chiloglottis Gunnii - - 176
Chlamydopsini, Victorian - 150
Clifton Hill Quarries - 3
Coal, South Australian Brown - - - 148
Cobberas, &c., Botany of - - - - 20
Coleman, Mrs. — Some Autumn Orchids 68, 103
Coleoptera of North-Western Victoria - 162
Cordyceps - - - 129
Crickets, Mole and Field - 86
Cystopteris fragilis - - 175
Daley, C., and Williamson, H. B.—Where Murray Rises - - - 4
Dandenong Ranges, Entomology of - 68, 79
Davey, H. W., F.E.S.—Introduction and Spread of Noxious Weeds - - 14, 50
Eltham, Excursion to - 149
Entomologist in Dandenong Ranges - 68, 79
Entomology at Toolangi - 43
Erigeron pappochroma, var. *oblongatus* - - - 162
Eriostemon obovalis - - 175
Ethnology at National Museum - - - 86
"Euancondit" - - 175
Eucalypts, Critical Revision of - - - - 24
Eucalypts of Victoria - 39
Eucalyptus Leaf, Fossil - 16
Eucalyptus neglecta - - 23
Eucalyptus Studleyensis 24, 38
Evelyn, Excursion to 25, 58
Fern, A New Victorian - 175
Field Naturalists' Club of Victoria—
Annual Report - - 26

PAGE
Excursions—
Alphington - - 77
Bayswater - - 67
Bendigo - - 67, 84
Biology School, University - - - 55
Blackburn - - 77
Black Rock - - 164
Botanical Gardens 111, 149
Cheltenham - - 77
Clifton Hill Quarries - 3
Eltham - - - 149
Evelyn - - 25, 58
Frankston - 98, 113
Langwarrin - - 78
Macedon - - - 13
Nar-Nar-Goon - 111, 152
National Museum - 25
Natya - - - 77
Pakenham - - 98
Panton's Gap - - 112
Ringwood - - 98
Sherbrooke - - 55
Technological Museum 41
Toolangi - - 13, 45
Torquay - - 149, 153
Upwey - 127, 152
Warrandyte - - 67
Yarra Junction - - 97
You Yangs - - 97
Exhibition of Wildflowers - 80, 111, 148
Financial Statement - 29
Hon. Life Members 127, 149
Nature Study Exhibition 47
Office-bearers, 1922-3 - 31
Presidential Address - 31
Proceedings 1, 13, 25, 41, 55, 67, 77, 97, 109, 127, 149, 161
Flora of South Australia 65
Forests Commission (Annual Report) - - 165
Fossils, Rare - - - 44
French, Mr. C., jun. - 69
Frankston, Excursion to 113
Fungus, A Rare - 129, 159
Gabriel, The late Mr. Joseph - - - 101, 111
Glymptoma Kingi - - 128

PAGE
Gold Coast, West Africa - 175
Goudie, J. C.—Coleoptera of North-West Victoria 162
Grampians, A Circuit of - 87
Grampians, Reservation at 99
Grasshopper, Crested - 151
"Half-Hours in the Bush House" - - - 66
Hanging Rock - - 13
Hardy, A. D.—Measurement of Trees - - 111
Helichrysum Gatesii - - 112
"Honey Flora of Victoria" - - - 76
Hon. Members - 127, 150
Horne, Dr. G.—Aboriginal Scrapers - - - 1
Journal of Royal Society of Western Australia 66
Kitson, Mr. A. E., C.M.G. 57
Kookaburra and Rabbit - 1
Langwarrin, Excursion to 78
Limestone Creek - - 9
Limestone Nodules - - 163
Macedon, Excursion to - 13
MacGillivray, Dr. W.—Trip from Broken Hill - - - 99, 131
Macquarie Island - - 176
Maiden, J. H., F.R.S. - 148
M'Callum, Dr. G.—Common Salt - - 111
Mount Gambier - - 16
Morrison, P. C.—Study of Serpulid - - - 42
Mueller Medal - - 148
Murray River, Rise of 4, 17
Nar-Nar-Goon, Excursion to - - - 111, 152
National Museum, Visit to 25
Nature Study Exhibition 47
Natya, Excursion to - 77
Oke, Chas.—Entomologist in Dandenongs in Winter - - 68, 79
Oke, Chas.—Notes on Victorian Chlamydopsini 150
Omeo District - - 4
"Opals and Agates" (Bartley), Extract from - - - - 108

PAGE
Orchid Notes - - - 42
Orchids, Autumn - 68, 103
Oreixenica corræ - - 2
Our Fortieth Volume - 176
Pakenham, Excursion to 114
Panton's Gap, Excursion to - - - - 111
Papilio macleayanus, Chrysalis of - - 3, 112
Plants, Bendigo - - 86
Plants, New Victorian - 162
Plumridge, Mr. C. L. - 102
Polyporus mylittæ - 150, 159
Prasophyllum Frenchii, var. *Tadgellianum* - - 176
Prasophyllum Suttonii - 176
Prostanthera Walteri - 150
Pterostylis Toveyana - 42
Pultenæa, The Genus - 148
Rabbit Attacked by Kookaburra - - 1
Rotifer, A Rare - - 130
Rotifers, Australian - - 40
Salt, Common - - - 111
Scott, A. L.—Notes of a Geologist in New Zealand - - - 150
Serpula, &c. - - - 56
Sea-Urchin, Cast of Fossil 127
Shells, Victorian "Mutton Fish" or "Ear" - 2
Simson, The late Mrs. J. - 39
"Some Wild-flowers of Tasmania" - - 126
PAGE
South Australia, Flora of 65
Spider, Bite of Red-striped 79
Spirulirostra - - - 154
Spry, The late Mr. F. P. 55, 60
Starlings - - - - 14
Stickland, The late Mr. W. 46
Studley Park, Cast of Sea-Urchin from - - 127
Tasmania, Wild-flowers of 126
Technological Museum, Visit to - - - 41
Termites and Ants - - 40
Thelymitra venosa - - 176
Toolangi, Entomology at 43
Toolangi, Excursion to 13, 43
Trees, Measurement of - 111
Torquay, Excursion to - 149
Tovey, The late Mr. J. R. 115
Trachyderma - - - 44
Trochosphæra æquatorialis 130
"'Twixt Bass Strait and Southern Ocean" - 33
Upwey, Excursion to - 127
Uracanthus acuta - - 129
Victoria, Eucalypts of - 39
Warrandyte, Excursion to 67
Waxflower, The Fairy - 175
Weeds, Noxious - 14, 50
Wild-flowers, Exhibition of - - - 80, 111
Williamson, Mr. H. B. - 12
Williamson, H. B., F.L.S. —Some Alpine Flowers 162
Wyperfield Park - - 42

ILLUSTRATIONS.

PAGE

Aboriginal Implements - - - 63, 64, 65
Bream Creek : Shell Mounds - - - - 156
Broken Hill District, Map of - - - - 132
Cast of Fossil Sea-Urchin - - - - - 158
Eucalypt, A Tall - - - - - - 169
Grampians, Map of - - - - - 88
Gravel Pit, Studley Park - - - - - 158
Spry, The late Mr. F. P. - - - - - 60
Torquay : An Upraised Sea-Bed - - - - 35
Torquay : Bird Rock and Cliffs - - - - 34
Trees, Measurement of - - - 169, 170, 171

ERRATA.

Page 12—Note referring to errors in April (1922) *Naturalist.*

Page 38, line 25—"Collected by Mr. E. H. Hatfield" should follow "N.S.W." in line 28.

Page 60, line 14—"zoologist" should read "curator."

Page 97, line 7—For "*Conospermum*" read "*Comespermum*"

Page 98, line 20—For "*D. corymbosum*" read "*D. floribunda.*"

Page 130, line 8—For "lygosid" read "lycosid."

Page 148—Correction of statement on page 82.

Page 151, line 4 from bottom—For "markings" read "colour."

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CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	1
Excursion to the Corporation and Collingwood Quarries	3
Where the Murray Rises. By Chas. Daley, B.A., F.L.S. and H. B. Williamson, F.L.S.	4
Personal	12
Correction	12

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1922.

Field Naturalists' Club of Victoria

ROOMS – ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 8th MAY, 1922.

1. Correspondence and Reports

2. Election of Members.

As Country Members—	Proposer.	Seconder.
Miss Gwendoline Jones, c/o Nicholson and Lethbridge, Corowa, New South Wales.	Mr. F. Chapman, A.L.S.	Mr. C. Oke.
Miss Ada Foster, c/o Mr. Jno. MacCorkindale, Wando Hills, Nareen, *via* Coleraine.	Mr. M. Moodie.	Mr. C. Oke.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

   Election of two Auditors.
   Nomination of Office-bearers for 1922–3.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

   By Mr. H. W. Davey, F.E.S. "The Introduction and Spread of Noxious Weeds."

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICE.

The new year commences with the current month. Subscriptions for 1922–3 must be paid before 12th June in order to qualify for voting at the annual election. Any unpaid subscriptions for 1921–2 should be forwarded to the Hon. Treasurer **at once.**

Any change of address should be notified to the Hon. Secretary at once.

The Victorian Naturalist.

Vol. XXXIX.—No. 1. MAY 4, 1922. No. 461.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 10th April, 1922.

The president, Mr. F. Chapman, A.L.S., occupied the chair, and about 70 members and visitors were present.

REPORT.

A report of the visit to the Clifton Hill quarries on Saturday, 25th March, was given by the leader, Mr. F. Chapman, A.L.S., who said that the outing proved very pleasant, and that it provided a good opportunity for studying the geological features of the volcanic rocks of the Melbourne district.

ELECTION OF MEMBERS.

On a ballot being taken, Miss G. E. Davis, Elsternwick; Miss P. J. Griffiths, B.A., 27 Grosvenor-street, Middle Brighton; and Miss M. Guest, 245 Latrobe-street, Melbourne, were duly elected members of the Club.

PAPER READ.

By Dr. Geo. Horne, V.D., entitled "Aboriginal Scrapers."

The author gave an interesting account of the method of manufacture and the different kinds of scrapers used by the Australian aboriginals, comparing them with the flints of other parts of the world, of which he exhibited a very fine collection from various countries. The making of implements usually fell to the old men of the tribe, who exhibited considerable patience in their work; yet when made they were not treasured as one would expect after so much labour.

Some discussion ensued, in which the chairman, Dr. Sutton, Messrs. Kershaw, Keep, and Barnard took part.

The chairman, Mr. F. Chapman, said that the principal source of the basalt glass which the Victorian aboriginals valued so much, on account of its peculiar toughness and homogeneity, was probably at Bulla, where large deposits of this rock are to be found.

NATURAL HISTORY NOTES.

Mr. A. D. Hardy, F.L.S., contributed a note on an occurrence which he had witnessed at Evelyn one day in December. His attention was attracted to a scuffling on a patch of cleared ground screened by bracken fern. He thought the Kookaburra, which he could see attempting to fly with a load, was raising and dropping a snake or lizard, but, being in doubt, went over to investigate, when "Jack" flew off, leaving the victim at

about its last gasp on the ground. This proved to be a young rabbit, which he subsequently found at the local store to weigh half a pound. He had made inquiries of the Vermin Destruction Department and of several experienced ornithologists, but could hear of no case of a Kookaburra attacking a young rabbit.

Mr. F. Keep said that during a recent visit to Kalimna, Lakes' Entrance, he met with a variegated form of the Hop Goodenia, *G. ovata*, in considerable quantities. This had a pleasing appearance, and might be worth cultivating as a garden shrub. Specimens were on exhibition for the benefit of those interested.

EXHIBITS.

By Mr. C. Daley, F.L.S.—Scrapers, knives, &c., ochre, spear-polisher, from a kitchen midden at Elwood, near Brighton.

By Miss A. Fuller.—Zamia Palm nuts, W.A.; cotton seeds, &c.; seeds of Nuytsia, Western Australian Christmas-bush; seeds of *Eucalyptus macrocarpa*, *E. pyriformis*, *E. Preissiana*, and *E. tetraptera*; Black-boy flower-stems: Western Australian crabs.

By Mr. C. J. Gabriel.—Specimens of all the Victorian species of "Mutton-fish" or "Ear Shells"—viz., *Haliotis albicans*, G. and T., *H. nævosa*, Martyn, *H. emmæ*, Rve., *H. conicopora*, Péron, and *H. cyclobates*, Péron.

By Dr. G. Horne, V.D.—A large series of aboriginal scrapers from Victoria, Tasmania, and Central Australia, also similar implements from other parts of the world for comparison.

By Mr. F. Keep.—*Goodenia ovata*, Hop Goodenia, from Kalimna, with variegated leaves.

By Mr. J. A. Kershaw, F.E.S. (on behalf of Mr. A. J. Williamson, Dunolly).—Aboriginal stone axe, grooved, showing evidence of having been used as a hammer at both ends, found at M'Intyre's, near Rheola, Victoria; aboriginal stone axe, ground, with two V-shaped transverse grooves, from Eastville, near Loddon, Eddington, Victoria. For National Museum.—Cast of double-headed stone hammer, from New South Wales; large aboriginal stone axe, ground, measuring 12½ inches by 8½ inches, found in virgin scrub on bank of Liverpool Creek, 14 miles from Innisfail, North Queensland, by S. Fitzgerald.

By Mr. C. Oke.—Small beetles (under microscope) from Belgrave excursion.

By Mr. F. Pitcher.—Fasciated growth of *Tecoma mackenni*, from his garden at South Yarra; also sample of stone used in large quantities fifty years ago for producing lime from at Cave Hill, Lilydale.

By Mr. L. Thorn.—The larvæ and perfect insects of a Victorian moth, *Nataxa flavescens*; a rare Victorian Mountain Brown Butterfly, *Oreixenica correæ*, taken on the top of Mount

Donna Buang, 4,050 feet above sea-level; also two species of berries from Mount Donna Buang.

By Mr. H. W. Whitmore.—Piece of bluestone (basalt) covered with vivianite, from the Collingwood quarries.

After the usual conversazione the meeting terminated.

EXCURSION TO THE CORPORATION AND COLLINGWOOD QUARRIES.

MEMBERS and friends who visited the above quarries on Saturday, 25th March, found the afternoon very pleasant, the weather being cool and genial. The lower part of the larger quarry showed many interesting features, and the bank of the old Merri Creek (of Pleistocene time) still showed the thick covering of river silt, with roots of Sheoak (*Casuarina*) and perhaps other vegetation *in situ*. The bedrock seemed only slightly hardened by contact where this occurred, but the effect of the cooling on the lower surface of the basalt had produced a thin seam of tachylyte or basalt glass. We had the advantage of the company of Mr. R. W. Armitage, who secured for the members some good examples of this glassy condition of the lava from the contact of the Silurian mudstone on the Merri Creek. The name tachylyte, given by Breithaupt, is derived from two Greek components, meaning rapid dissolution, and so named on account of the rapidity with which it undergoes fusion before the blow-pipe. The termination "lyte" is not to be confused with "lite," the latter being derived from *lithos*, stone. The common zeolites were gathered by members, and the minerals included aragonite, ferrocalcite, magnesite, vivianite, halloysitic clay, and possibly mesolite. In one instance a miniature cavern was noticed in the bluestone, which had a floor of ferrocalcite in process of building up, much as stalagmite occurs in the Buchan Caves. The cooled surfaces of the various lava streams, of which many are seen superposed in the quarry, were indicated by some very fine ropy structure. Bomboidal weathering of the massive blocks and the rough columnar structure, often radially arranged, were pointed out. In a pool in the floor of the quarry Mr. J. Stickland found a quantity of a very minute form of the protista (a link between plants and animals) of the genus *Chlamydomonas*, as well as the tubular thallus of the alga *Enteromorpha*, probably allied to the species discovered at Burnley under similar conditions. The adjacent Merri Creek was next visited, where we had the opportunity of examining some fine examples of radial columnar jointing, basaltic pavement, and stratified mudstone. This concluded the programme of an instructive and enjoyable afternoon amongst the volcanic rocks of Melbourne.—F. CHAPMAN.

WHERE THE MURRAY RISES.*

BY CHAS. DALEY, B.A., F.L.S., AND H. B. WILLIAMSON, F.L.S.

(*Read before the Field Naturalists' Club of Victoria, 13th Mar.*, 1922.)

PART I.—PHYSIOGRAPHICAL AND GENERAL NOTES, BY C. DALEY, F.L.S.

FOR many years, from the nature of its geographical position and remoteness from large centres of population, the Omeo district was, of necessity, more isolated than almost any part of Victoria; but with the extension of the railway to Orbost reducing the distance from railway communication, the rapid development in motor travelling, and the practical outcome of the series of motor reliability tests in the Alpine regions of Victoria, the disadvantages mentioned have been greatly minimised. At pleasant Bruthen (bracken or ferns), on the foothills above the rich spreading fields of maize that delight the eye, there is plain evidence that "the old order changeth," for, even as horse-teams replaced the old bullock-teams in outback transport, so here in the main street is a recently-introduced motor lorry which plies regularly from Bruthen to Omeo and Benambra. If its service prove effective, such motors will in time banish the useful six or eight-horse teams from the road transport. The coach of a few years ago has already gone, and in its stead is the speedier and more prosaic rival installed, annihilating distance and facilitating intercourse.

Our party of four, Messrs. Williamson, Hughes, Allen, and the writer, started early by motor, and after a few miles' journey through the hills regained the picturesque valley of the Tambo, along which for many miles the Omeo road runs. It would at any time be an interesting journey, but the favourable season increased the impression of its fertility. We glided in and out, past maize fields on the flat, rich pastures where fat Hereford cattle grazed, over stony rises and steep pinches, past lonely steadings on river or creek.

The river course is usually fringed with high cliffs, often presenting in the bed the upturned edge of stratified or metamorphic rocks, with hard intrusive masses of stone. At Tambo Crossing a road goes off north-west to Stirling, a small gold-mining centre. The general geological formation of the Tambo Valley rocks is metamorphic in character, with varying granitic, Ordovician, and Silurian formations in contact or proximity. The western tributaries of the Tambo are mostly auriferous, and the formation Ordovician. Further up we come to Ensay, prettily situated in the fertile valley, with the

* A map detailing this part of Victoria will be found in the *Naturalist* for January, 1912 (vol. xxviii., p. 72).—ED. *Vict. Nat.*

mountains rising up on the eastern side. There is a quaint bridge and a ford over the stream; and from every side to a typical country race meeting settlers were hastening.

The Tambo Valley is fruitful in historical associations, being the original gateway into Gippsland, along which Angus M'Millan, nearly ninety years ago, and afterwards Count Strzlecki made their way to the Lakes, and ultimately to the coast—the latter at Western Port, the former at Port Albert. M'Millan's first cattle station was here, at Numblamunjie ("the place of blackfish"), afterwards called by M'Leod, a later occupant, Ensay, from an island home west of Scotland. From Ensay the valley opened out until Doctor's Flat was reached, named after Dr. Arbuckle, of M'Millan's party, who was here before taking up Mewburn Park, at Tinamba, a year or two later.

Passing over fertile pasture lands, we reached Swift's Creek, where dinner was served. The rich Ordovician measures of Cassilis are higher up on this creek. Here we left the Tambo Valley, after passing Mount Tongio on the left, through the little town of Tongiomunjie ("the place of high cliffs"), and on a rapidly-rising road, from which the view of mountain and valley was delightful, diverged north-west towards Omeo. Tongio was one of the first runs selected in Gippsland, probably in 1838, by E. Coady Buckley, afterwards of Prospect station, south of Longford. As we ascended towards the Tongio Gap, the play of sunshine and shadow on the ranges enclosing the valley we had left made a delightful scene. From the Gap (2,700 feet above sea-level), with a last look at the fair prospect behind us, we gradually descended over the bare hills, where we, however, caught sight of our first Snow Gums, to Omeo, 2,100 feet above the sea and 67 miles from Bruthen.

Omeo, at one time a bustling, prosperous mining town, is pleasantly and picturesquely situated along the sinuous course of the Livingstone River, which, with the neighbouring mountain, is named after one of the original district pioneers of 1835. It reminds one of Walhalla, but the river valley is wider, and the surrounding hills do not so obtrusively encroach upon the main highway. The hotel accommodation at Omeo leaves much to be desired. As the town is so favourably situated for the rapidly-expanding Alpine tourist traffic, this should be remedied.

While Messrs. Williamson and Allen journeyed towards Mount Livingstone and Cobungra, Mr. Hughes and I went down the river, and, crossing it, after a steep climb reached the summit of the Bingo Range, north of the town, from which a fine view of the surroundings is obtainable. On our way we were interested in the great number of cockchafers which

were on the young Peppermints near the river. Their number was legion, and in some places the tender leaves had been almost stripped off the young gums by their voracity. Young grasshoppers were also very numerous, our attention being attracted to them by the unusual gathering of Blue Wrens that were busily employed in improving the occasion. Insect life on the slopes of the hill was varied. Butterflies flew about the flowering gorse. We watched with interest a wasp that was laboriously flying to his cells with a beetle, the latter nearly as big as his captor. Only short flights were possible. Another wasp had as a prize a juicy March-fly. This range had formerly been well timbered, but the present vegetation is all secondary growth, with very little scrub. We also made an excursion up the stream, where, near the ever-spreading blackberry thickets, we saw a snake, which eluded our observation before we could obtain a stick. In the Livingstone River there has been a great deal of alluvial mining, hydraulic appliances and sluicing being extensively used for the recovery of gold. The alluvial in river and terrace deposits has been of great extent. The surrounding ranges are metamorphic in character, the original stratified rocks, according to the late Mr. Howitt, having mostly been altered into silky micaceous schists, gneiss, gneissose and schistose granite, with dykes and intrusive rock masses. Around Omeo the micaceous character of the rock formation is very marked indeed. We were interested in the water-worn pebbles and stones, which show the very varied character of the rocks from which they came—igneous, metamorphic, sedimentary, with minerals connected therewith. Later, at Mr. Blackburn's, in Omeo, we examined a fine collection of district rocks and minerals of great variety and interest. Silicified wood is frequently found in the alluvial measures. Omeo has been noted more for the richness and extent of its alluvial wash than for its reef formations. Quartz outcrops through the micaceous rock-mass are noticeable in all the road cuttings.

Leaving Omeo by the kindly services of a motorist (the coach (!) being unable to take impedimenta, parcels, and ourselves), we went by a winding and ascending road giving vistas of distant valleys and mountains until we reached "The Sugarloaf," a few miles out on the Benambra road, where there burst upon our gaze one of the finest views obtainable in Victoria. At Omeo we had heard of "The Plains," but "the half was never told." They consist of bare or almost treeless low hills surrounding the basin of Lake Omeo, and stretches of flat pasture land. From this area rises up on each side, to the horizon, lofty mountains in ridge and peak. Just beyond are The Brothers, Mounts Leinster, Misery, and Tambo to the north-

east, The Sisters to the east, the Gibbo north-west, and, past the Knocker, Glen Wills, with Bogong in massive contour further west, the Omeo Ranges closing in southwards—a striking panorama, interesting in its beauty, its vivid contrast and variety. Far away beyond all is the summit of "Kossy," as the monarch of the Alps (Kosciusko, 7,200 feet) is familiarly called. "Lake" Omeo lies in the centre of this landscape, and insensibly there came to mind an oft-reiterated and implicitly believed tag of schooldays—"Omeo on Lake Omeo, north-east of Victoria." They *are* both north-east, but the town is separated by miles of hills from the lake, and the lake belies its name, for it is destitute of water. It is, however, still retained in the official list of Victorian lakes as possessing an area of 1,966 acres. Some years ago, at the deepest part, there was nine feet of water, and boats were used upon it; now it is a perfectly level expanse, an ideal spot for the landing of aeroplanes and a grazing area for cattle. In Strzlecki's map of his route into Gippsland the track is marked right through the *centre* of the lake from north to south, so that even in 1840 it was probably dry, and, according to old settlers, that is its usual condition, evaporation in such a shallow basin being very great, and apparently no stream of any volume flows into it, although the soakage from the hills surrounding it must be considerable in wet seasons.

From the Sugarloaf a quick run along the border of the lake, past splendid crops and rich cattle pastures, brought us to the little town of Benambra, pleasantly situated on rising ground at the northern extremity of the lake, the centre of the rich cattle country extending back to the Murray over uplands, river flats, and mountain heights. Having secured comfortable private accommodation, after a survey of our environment from surrounding hills of metamorphic formation, very sparsely or not at all timbered, we took the opportunity of attending a local sports gathering in a paddock bordering the other side of the lake, hack races being run on a portion of the level bed. Crossing to the sports, we noticed at the lower end of the lake, about seven miles away, a very distinct mirage, showing water and trees. The local gathering partook of the character of a pleasant, sociable picnic. An agent of the Immigration Bureau was engaged in taking features of the day, as well as of the district occupations and scenery, for reproduction abroad. It was pleasing, after city conditions, to see the fine show of horses, to the number of about 200, which were tethered around the paddock, whilst the presence of thirteen motor-cars gave evidence of the prevailing trend. One was struck by the appearance of material prosperity as well as of vigorous health and fine physique of the residents in this breezy locality. Benambra, of course, suffers from remoteness from a railway,

and, speaking with a good knowledge of the eastern part of the State, I know of no part that appears to offer better prospects for railway construction than from Bruthen to Benambra *via* the Tambo Valley, Tongio, and Omeo. Under such a stimulus production would be more varied and greatly increased, the mineral resources would be properly tested, and the district be capable of maintaining a much larger population. In addition, the Alpine regions would be efficiently opened up for tourists in search of the picturesque. From Benambra access can be made to Mount Kosciusko, 59 miles distant, through interesting country; but there is need of the track being clearly defined as far as Tom Groggin, the ford on the Murray.

Having been fortunate enough to engage the services of Mr. Fred. Jarvis, an excellent bushman, as guide, whilst waiting until he could make arrangements for horses suitable for four persons whose horsemanship was, through disuse for many years, somewhat uncertain, we decided to make the ascent of The Brothers, 4,667 feet in height, distant about four miles. Crossing the flood-plain and stream of Morass Creek, where we saw a number of wildfowl among the swamp vegetation, we made for the foot of the range through some well-grassed paddocks. Seeing a copperhead snake coiled up near a fence, I smashed its head in with a stick, to find that it was already dead, although there was no other bruise or mark upon its body. After lunch at a creek, we pursued our way, finding the ascent arduous, but persisted until we reached a central peak: then clouds and rain prevented a clear prospect. This range is of granite, somewhat like syenite in appearance. On the top are many huge masses or tors, and the slopes are generally well wooded. The range is part of the watershed of the Mitta Mitta. We found a dancing-mound, but saw no Lyre-birds, although on several occasions we heard their calls. Wonga Pigeons were numerous in this range. Want of time and adverse weather combined to prevent further exploration of this rugged granitic range, which is a dominant feature of the landscape at Benambra, presenting to view, no matter from what point it is observed, three peaks.

Next morning, our guide having made satisfactory arrangements in regard to our mounts, the cavalcade, with a pack-horse to carry supplies for four or five days, set off for Limestone Creek. The road leads generally north-east from Benambra, skirting the edge of an extensive plain through which Morass Creek sluggishly winds around the foot of The Brothers. Some five miles out, after passing a fine herd of about 200 cattle on the way to a muster yard, we came opposite a homestead some distance from the road, which marks the site of the old home of James M'Farlane, the discoverer of Omeo Plains, who settled

on these rich river flats about 1836. Ahead of us we had a clear though distant view of M'Farlane's Look-out, an abrupt and prominent peak, from which, tradition states, M'Farlane first beheld the plains country, with its fine pastures. Mounts Tambo and Little Tambo were in bold relief away to our right.

Our track, rising upwards over country of a metamorphic nature, passed through forest where Snow Gum, Silvertop, Peppermint, Black Sallee, and Candlebark were the chief timber trees; but one missed the luxuriance of growth which marks the Southern Gippsland district. Continuing along a ridge of the Bowen Range, we passed two or three sections which have been taken up by returned soldiers, who deserve every success for their enterprise in such a remote region. In Mac's Creek, which we crossed, stream tin has been obtained in moderate quantities. Near Maringo Creek, further on, flowing through a pleasant valley with fine clumps of Black Sallee, we were much interested in observing the eager and general response of the cattle grazing in the vicinity to the clear, musical call of someone desirous of assembling them, the cattle coming from every side towards the penetrating sound of the voice. This is explained from the fact that mountain cattle are accustomed to be called in this manner when, at regular periods, the salt-licks are replenished, and, recognizing the call, they associate it instinctively with the desire to satisfy the craving for salt.

From the Maringo we rose quickly through the thick forests of Snow Gum, obtaining occasionally glimpses of deep valleys and distant ranges, whilst Mount Misery loomed to the north, forest-clad to the summit. We crossed this divide at 4,800 feet, and then began to descend on a steep gradient, until, in a ride of about three miles, we dropped 1,200 feet into the Limestone Creek, the ultimate source of the Murray River, which, at first a trickling stream, gains volume from the numerous mountain springs, and soon flows—clear, sparkling, and swift—over a pebbly bottom past the limestone hills, until by the accession of tributaries, after a course of 18 miles, it becomes the Indi or Murray. There is a considerable area of the Devonian limestone in this district, with granite towards Mount Leinster, and with Silurian and trap rocks in contact in the surrounding ranges. An outcrop of serpentine is passed on the ridge, about a hundred yards from the track, just before descending into Limestone Creek. An auriferous gravel deposit making into the flat was at one time worked, and the evidence of extensive sluicing operations for gold recovery is seen.

We camped in a hut used in cattle musters, and belonging to Mr. L. Pender—a name associated with the earliest occupation of the district. Tired with our 25 miles' ride, we retired early, two of the party sleeping in the open. The drop in the

temperature after nightfall was considerable. Numerous bush-rats scampered about the hut; the howl of a dingo was heard, with the reiterated Boobook's call; and, before dawn, we could hear the noise made by twelve or fourteen kangaroos, seen just behind the hut, where it appeared to be their custom to come from the hills to lick the empty hollowed troughs in which salt is placed at certain times for the cattle which also frequented the spot. At the first glimpse of dawn, from the trees bordering the creek came, harmoniously blent, the songs and calls of countless birds in joyful chorus, the notes of some being unfamiliar, but not the less welcome to our ears. After breakfast we set out on foot to inspect the Limestone caves, which are a feature of this remote creek. The first cave, a small one, had the entrance blocked by the fall of rock; the others we entered had features similar to those of Buchan and other caves of like origin. Of course, comparison is out of the question, these caves as yet being undeveloped, and lacking the conveniences, protection, and effective lighting which render the Buchan Caves so attractive under inspection. The entrances are at present difficult to negotiate. There is evidence of thoughtless vandalism in the destruction of stalactites and stalagmites; but in course of time, with easier access to the district, and perhaps Government or local control and direction, it is certain that many caves will be opened up for inspection. The largest cave, on the left of the stream, is entered in a prone position over some saplings placed above the water beneath. About the middle of this cave is an intrusive deposit of water-worn pebbles, almost cemented together and several feet thick, marking a terrace or bed formed by water action at some remote period. At several places water was flowing out through the limestone of the hills.

In the afternoon a walk of about two or three miles to an adjacent creek brought us to the place where the marble quarries have been opened up, and from which Mr. Summers obtained marble of good quality and of variety in colouring, from white and somewhat slaty saccharoidal to grey, pinkish, and mottled. The sub-crystalline limestones of the creek contain corals and brachiopods and remains of other marine fauna. The quarries are now idle, awaiting future development, there being abundant scope for the production of marble from the hills. As at Buchan, in the vicinity and in connection with this Devonian limestone occur minerals such as galena, silver, iron, manganese, &c., but not in any definite formations or to great extent. The wolfram mines at Mount Murphy are to the north-west of this area.

Next day we were early in the saddle, and after crossing the Dividing Range over the rough country separating the head waters of the Tambo from those of the Murray, we made for

the Cobberas, the country being metamorphic schists, Silurian rocks, and felstone porphyries. The late Mr. A. W. Howitt said of this range, which is part of a system extending to near Buchan, that it is the "remains of a great volcanic sheet . . . The lowest portion approaches the quartz-porphyries in character. . . The line of a meridional fissure on which a series of volcanoes were built up": and the "quartz-porphyries were denuded stumps of volcanoes around which felstone, ash, agglomerate, and indefinite felsitic rocks are still grouped." After some hours' riding over these rocky hills, where the Native Hop-bush grew under the prevailing Snow Gums, we reached the Native Dog Creek, a tributary of the Buchan River. This alpine stream flows down the centre of a long grass-covered and treeless sloping plain or valley between the Cobberas and the ranges west of the Snowy River watershed. Following this up over the black, peaty soil, where soft tussocky Snow Grass and alpine flora grow profusely, we came to the foot of the most rugged part of the Cobberas Range, where, securing our horses, we prepared to climb to the summit. On entering this peaceful valley we had seen a group of four or five wild horses, and, coming higher, had again seen another group issuing from the timber on the opposite range. An attempt to secure a photograph was unsuccessful. A little later a mob of ten, with a white stallion as leader, was seen coming from the sheltering timber on to "The Playground," as this plain is appropriately called, for it is a favourite haunt of the brumbies, being open, well watered, well grassed with succulent feed, and forest cover and mountain retreat are close at hand. The ascent to the summit (6,030 feet above sea-level) was somewhat laborious, amid rough and often jagged rock-masses of felspar porphyry, over a prolific spring-fed growth of the soft Snow Grass, and amid the ever-present Snow Gums, whose bent and grotesque limbs bore testimony to the severity of winter snows, the force of driving winds, as well as to the ravages of occasional bush-fires. Among the rocks, Asters, Daisies, Violets, Shaggy Peas, Veronicas, Flax and Vanilla Lilies, Trigger-plants, and Euphrasias bloomed in great luxuriance, being of unusual size as well as of richness in colouring—a veritable alpine garden of delight. Baron von Mueller, visiting the Cobberas in 1853, speaks of Sphagnum Moss growing in the mountain valleys.

The Cobberas Range is in three main peaks, and from its commanding position gives a most extensive view of alpine summits and lofty ranges extending on all sides to the horizon. The day was fine, but a little hazy in the far distance. Nearly north, five miles distant, and marking the boundary-line of the State, was Forest Hill, 5,000 feet in height, yet dwarfed in apparent size, and seemingly merged in the lordly Pilot

(6,010 feet) just behind it. From its base springs the small stream called the Murray, which, uniting with the creek rising in the Cobberas, joins Limestone Creek, the main source and the longest of the contributory streams, whose waters form the Indi or Murray proper. Away behind the Pilot, over intervening lofty peaks and high plains, clearly rises Kosciusko, 25 miles distant, the culminating peak of the alpine system, the patches of snow on its slopes being distinctly visible. Slightly to the north-west the Gibbo Range is prominent, 5,764 feet in height. Nearly west Mount Misery is seen, and away beyond the ranges we had ridden over appeared Mount Wills, 5,758 feet, in front of the impressive Bogong Range (6,508 feet), which, although 40 miles away, shows where snow-drifts linger on its bosom. Eastward, across the Playground, stretch the ranges of the Snowy watershed, with the Monaro plateau beyond, whilst to the south-east are Black Mountain and the "Suggan Boggan" of Miss Marie Pitt's poem. Southwards, as everywhere, an endless succession of range upon range, peak on peak, to the bounds of vision. Silence and solitude brood over this vast panorama. A wild horse whinnies, a Lyre-bird calls, a Parrot shrieks, but in no direction is there sound or sign of human habitation. It is a singularly impressive scene of stern, rugged grandeur; but, under alternate sun and shadow, there is a shifting play of colour, while the deep purple of distant ranges, the light airiness and soft, fleecy whiteness of cloud masses drifting up from deep valleys, give ever-changing aspects. On a clear day the eye can discern the ocean at Twofold Bay, far to the east. There are few more widespread and imposing prospects of so wild and pristine a nature in Australia. Reluctantly we descended, and, resuming the saddle, rode down the eastern side of the Playground, diverging to obtain a nearer view of an imposing mountain escarpment known as Ram's Head; then, recrossing Native Dog Creek lower down, we passed over an outcrop of dark blue to black limestone or marble in contact with porphyry. Here our guide "called" the cattle at the creek until about a hundred had assembled from all sides, and a photograph was taken of the expectant herd. We reached camp safely, and, after tea, tried fishing for trout in the stream, but unsuccessfully.

(*To be continued.*)

PERSONAL.—Members will be pleased to know that Mr. H. B. Williamson, well known for his researches into Victorian botany, has been elected a fellow of the Linnean Society of London (F.L.S.)

CORRECTION.—In the April *Naturalist* the word "Farrangei" on page 135, and in index page v. and page vii. (errata), should read "Farragei."

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The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

Published 8th June, 1922.

Hon. Editor: F. G. A. BARNARD, Esq

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	13
Where the Murray Rises. By Chas. Daley, B.A., F.L.S. and H. B. Williamson, F.L.S.	17
Notes	24

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1922.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 12th JUNE, 1922.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Miss C. Morres, Thanet Street, Malvern.	Mrs. Thompson.	Mr. C. Oke.
Mr. Alfred Bishop, 8 Dudley Street, East Caulfield.	Mr. A. E. Keep.	Mr. C. Oke.
As Country Member—		
Mr. W. C. Tonge, Eltham.	Mr. E. S. Anthony.	Mr. F. Pitcher.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

   (*a*) Consideration of Annual Report and Balance Sheet.

   (*b*) Election of Office-Bearers for 1922-3.

   The following nominations have been made:—

   President:—Mr. F. Chapman, A.L.S.; Mr. C. Daley, B.A.

   Vice-Presidents (two):—Mr. F. Chapman, A.L.S.; Mr. C. Daley, B.A.; Mr. E. E. Pescott, F.L.S.; Mr. A. J. Tadgell.

   Hon. Treasurer:—Mr. F. Pitcher.

   Hon. Librarian:—Mr. P. R. H. St. John.

   Hon. Editor:—Mr. F. G. A. Barnard.

   Hon. Secretary:—Mr. C. Oke.

   Hon. Assistant Secretary and Librarian:—Mr. H. B. Williamson, F.L.S.

   Committee:—Messrs. C. L. Barrett, C.M.Z.S., F. Chapman, A.L.S., E. Cox, C. Daley, B.A., J. Gabriel, A. D. Hardy, A. E. Keep, J. A. Kershaw, F.E.S., E. E. Pescott, F.L.S., J. Searle, J. Stickland, C. S. Sutton, M.B., B.S., A. J. Tadgell, and F. E. Wilson. (Five to be elected.)

   NOTE.—Subscriptions for 1922-3 must be paid in order to qualify for voting.

   (*c*) Presidential Address—Mr. F. Chapman, A.L.S.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

The Victorian Naturalist.

Vol. XXXIX.—No. 2. JUNE 8, 1922. No. 462

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 8th May, 1922.

The president, Mr. F. Chapman, A.L.S., occupied the chair, and about seventy members and visitors were present.

REPORTS.

In the absence of Miss G. Nokes, who acted as leader, a report of the Easter excursion to Toolangi (13th–18th April) was given by Mr. A. E. Keep, who said that it had been a very enjoyable outing. Unfortunately, in the absence of recognized authorities in different branches of science, with the exception of lepidoptera, the results were not quite so definite as they might have been. The scenery, however, was of the best, the beauty of the ferns, beeches (myrtles), eucalypts, &c., being indescribable. A considerable amount of ground was covered during the four days, but owing to density of the vegetation the rambles had to be confined to tracks, more or less difficult to follow. The entomological member of the party was well satisfied with his captures, and proposed to say something about them at a later date.

A report of the excursion to Macedon on Saturday to Monday, 29th April to 1st May, was given by the leader, Mr. C. Daley, F.L.S., who reported an interesting outing. At the State Nursery the officer in charge, Mr. Stancliffe, had pointed out the many interesting trees, especially the exotic conifers, which, in many cases, form very fine specimens. He also gave a number of instructive details regarding them and the general working of the nursery. The party then proceeded to Messrs. Taylor and Sangster's nursery at Upper Macedon, where the rhododendrons, azaleas, hollies, and other trees and shrubs accustomed to higher elevations form such a feature of the collection. Lunch was then taken on the banks of Stony Creek, after which the tourist track was followed to the Camel's Hump. This was reached rather late in the afternoon, but just in time to get a view of the vast panorama visible from this well-known vantage point. Proceeding over the range for another mile, the farm-house at which accommodation had been arranged for was reached. Sunday was devoted to a visit to the Hanging Rock (Mount Diogenes), and later to the late Mr. M'Gregor's garden on the northern slope of Mount Macedon, where there is also a fine collection of trees suitable for high altitudes. Monday morning was spent in a ramble to the Divide near Hesket school, and in the afternoon walking, *via*

Braemar House, to Woodend, where the train was taken for home. Few flowers were noted, owing to the time of year, the physiography of the district forming the principal subject of interest.

ELECTION OF MEMBERS.

On a ballot being taken, Miss Gwendoline Jones, Corowa, N.S.W., and Miss Ada Foster, Nareen, *via* Coleraine, were duly elected as country members of the Club.

GENERAL BUSINESS.

Messrs. G. Hooke and A. J. Tadgell were elected to audit the accounts for 1921–22.

Nominations of office-bearers for the year 1922–23 were then made.

Mr. A. D. Hardy said that the Forests Commission had a number of surplus trees at the Macedon State Nursery which could be obtained at very moderate prices. A list had been prepared, and copies, giving the prices and other details, could be obtained from the secretary of the Forests Commission, Public Offices, Melbourne.

PAPER READ.

By Mr. H. W. Davey, F.E.S., entitled "The Introduction and Spread of Noxious Weeds."

The author pointed out the many ways by which weeds may be introduced and become dispersed through the country. He expressed himself as greatly averse to the introduction of fresh animals, birds, insects, or plants to a country, even as controls of pests already established, as nothing could be guaranteed as to what might become the habits of such introductions in new environments, instancing the Starling, which he considered one of the worst pests yet introduced.

The paper was attentively followed, and promoted considerable discussion, mostly in support of the author's contentions.

Mr. H. B. Williamson, F.L.S., gave instances which had come under his notice at Geelong of the introduction of weeds by means of ships' ballast, and their subsequent spread over large areas.

Mr. E. E. Pescott, in the course of his remarks, supported the author's statement regarding the Starlings, which was combated by Miss R. Currie, who contended that the Starling is one of the farmer's best friends.

Mr. A. D. Hardy thought that Starlings preferred insect food, if available, to fruit, and believed that the Starling was often blamed for destruction which was really caused by the Blackbird—a bird he had found to be a greater nuisance. As an instance of the adaptability of introduced plants to circumstances, he mentioned the False Dandelion, *Hypochæris radicata*, which grows tender and juicy in the recesses of the Otway

Forest; short, stocky, and hard on the shores of Lake Colac; slender and wiry within the spray of the breakers on the south coast, in the Mallee, and on such heights as Macedon, St. Leonard, and Donna-buang.

Mr. J. Gabriel said that when the Club party visited the Kent Group, in Bass Strait, in November, 1890, he had been requested by the late Baron von Mueller to collect a specimen of every plant he could find. When the three hundred specimens were examined it was found that only 125 were endemic. He thought that Starlings generally were beneficial.

Mr. P. C. Morrison said that, when staying at Pakenham recently, there was a plague of grasshoppers, and, though many Starlings were about, they left the grasshoppers untouched and feasted on the fruit.

Mr. D. Best was afraid that members were apt to criticise without being sure of their facts. Had it been proved that some so-called pests—blackberries and St. John's Wort—were absolutely useless? Had any effort been made to turn them to some useful account, such as paper-making? The Broken Hill mines won their reputations as silver mines, but now the production of zinc far outweighed the silver mined. He thought that in course of time a use would be found for many of the things we now call "pests."

The author said he was glad to have the opportunity of replying, for he desired to emphasize what he had said about the Starling. This bird, while it did eat insects, also ate a good many other things, and in the Western District had developed a new taste—viz., a liking for wheat in the milk stage, and, in consequence of this, several hundred acres of crop had been destroyed this year. Near a certain country town they were wont to congregate in thousands for roosting purposes in some timber surrounding the town's water supply. He left it to the members to imagine what that water supply would become.

REMARKS ON EXHIBITS.

Mr. A. L. Scott drew attention to his exhibit of scoria, &c., from Mount Eden, which is one of a number of extinct volcanoes in the immediate neighbourhood of Auckland, N.Z. The cone and crater of this volcano are in excellent preservation. The cone is built up of scoria, and is about 300 feet high. The crater occupies practically the whole of the summit, and is of considerable diameter and depth. The rock is basanite, very similar to our common road-metal, bluestone or basalt, but is more basic—*i.e.*, less silica has been taken up in the minerals of which it is composed.

Mr. C. Oke drew attention to his exhibits of a dipterous fly and a mallophaga, Philapterus (sp. ?) under microscope. Both these insects were taken from a Laughing Jackass, *Dacelo gigas*,

which had been shot by some so-called "sports" and left to die. It was taken home by a gentleman and given a drink, but soon died, after which he had obtained it and examined it for parasites. He asked any members who might happen to come across dead or maimed birds to let either Mr. H. Clinton or himself have them to search for parasites. They wanted parasites, but would not kill birds to obtain them.

Mr. F. Chapman, A.L.S., drew attention to his exhibit of a fossil eucalyptus leaf, found by Mr. Wilfred Henty in the volcanic tuff of Mount Gambier, South Australia. The specimen was almost unique, as it belonged to a modern type of eucalypt—one with thin foliage and oblique venation. The leaf probably became fossilized by being covered over by a wet volcanic dust shower that subsequently hardened into a cement, like the Roman trass. He referred in eulogistic terms to Dr. C. Fenner's paper on the locality, recently published in the *Proceedings of the Royal Society of South Australia.*

EXHIBITS.

By Mr. F. G. A. Barnard.—Living specimen of the Red-striped (poisonous) Spider, *Latrodectus scelio.* Some account of this spider will be found in the *Victorian Naturalist* for January, 1891 (vol. vii., p. 140).

By Mr. F. Chapman, A.L.S. Photograph of a luminous fungus, photgraphed by its own light; fossil eucalyptus leaf in volcanic tuff, from Mount Gambier, on behalf of Wilfred Henty, Esq.

By Mr. C. Daley, B.A., F.L.S.—Dacite from Mount Macedon, solvsbergite from Hanging Rock, and limbergite from near Hesket.

By Mr. H. W. Davey, F.E.S.—Peripatus, from Kinglake, 4/5/22.

By Mr. C. Oke.—Mallophaga, Philapterus (sp. ?) and a dipterous fly, taken from a dead Laughing Jackass, *Dacelo gigas.*

By Mr. A. E. Rodda.—Growing specimens of Coral Fern and Screw Fern, from Moe Swamp: on behalf of Geological Survey of Victoria, crustacean fossils from Port Darwin, Northern Territory, and Moreton Bay, Queensland.

By Mr. A. L. Scott.—Scoria from Mount Eden, Auckland, New Zealand.

By Mr. L. Thorn.—Top and lower jaw of Bulldog Shark, *Cestracion phillipi,* commonly known as "Pig-fish": also two parasitic sea-leeches which were found attached to the under side of this Bulldog Shark, caught on 1st May, off Edith Vale, Port Phillip.

By Mr. H. Whitmore.—Slate from Long Tunnel mine, Walhalla.

After the usual conversazione the meeting terminated.

WHERE THE MURRAY RISES.

By CHAS. DALEY, B.A., F.L.S., AND H. B. WILLIAMSON, F.L.S.

(*Read before the Field Naturalists' Club of Victoria, 13th Mar.*, 1922.)

(*Continued from page* 12.)

On the morrow we rode back to Benambra. Occasionally we had seen kangaroos in the forest, three dingoes had crossed our tracks, and we found rabbits widely distributed. On our way back we saw a Wedge-tailed Eagle carry off a rabbit to some distance, and we had an adventure with a large snake, which, placing itself in an aggressive attitude, disputed the right-of-way until disabled and killed. In the vicinity of Mount Pender our guide showed us an outcrop of mineralized stone containing traces of copper pyrites. These ranges may yet, when fully prospected, yield mineral wealth.

We rested at Benambra over the Sunday. Messrs. Williamson and Allen returned to Omeo on Monday. Mr. Hughes and I spent the day principally in examining the lake, on which we found evidences of three distinct beaches, one of them (on the eastern side) being marked by white nodular concretions. The lake gives evidence of having been dry for years, and water, if present in its shallow bed, would be the sport of the winds. A low range divides the lake from the Morass Creek valley on the north. Some years ago a project was favourably reported upon by which the water from Morass Creek, a permanent stream, could be diverted by channels and pass through a tunnel in the hills into Lake Omeo, in order to keep it permanently filled.

On Tuesday Mr. Hughes and I left Benambra, and, reaching Omeo, found that Messrs. Williamson and Allen had gone for the day to Cobungra in search of *Eucalyptus neglecta.* At 6 p.m. they returned in triumph with visible trophies of their success. They left for Bruthen early next day. Mr. Hughes and I left at 7 a.m. by coach on Thursday for Bright.* The road passes up the Livingstone towards the divergent track to Cassilis, then crosses the Livingstone at the Memorial Bridge. The great extent of the hydraulic workings in the past is very noticeable, the valley of the river being strewn with a mass of pebbles and boulders. The blackberry grows riotously luxuriant along the stream. Winding in and out, but always upward, the road leads over the slope of Mount Livingstone (4,007 feet). Quartz outcrops were noticed here and there in the country rock. At a little creek we passed the track connecting the Bright road with Cassilis, and were soon on the track to Cobungra, noted for the perennial richness of its

* [This portion of the trip is well illustrated in Mr. G. R. Broadbent's recent booklet, "Across the Alps."—ED. *Vict. Nat.*]

pastures. The old hotel is closed, and the only place with sign of residence is Riggall's fine cattle station. The cattle —Hereford, as usual—were fat and healthy. An Emu—the second we had seen—was grazing with the cattle.

Leaving the Victoria River, the road led upward through fairly thick timber, until a height of nearly 5,000 feet was reached. A stop was made for lunch at an improvised camp where horses are changed, near Mr. Sharp's homestead. Further on three separate parties were passed who were engaged in road mending or making on the area where the basaltic flow occurs which extends over the Cobungra and Dargo High Plains, a frequent though disconnected capping of the highest ranges, the residuum of the extensive lava-sheets of the Older Basalt era, in which probably, at the close of the Miocene period, the lava flowing down filled the ancient valleys, thus forming a great plateau of immense extent, which in the process of ages has by incessant and extensive denudation been resolved into the existing mountain and valley systems. Beneath this basalt on the Dargo High Plains fossil leaf-beds and impure lignites occur; and at the Cobungra mine auriferous river-gravels, conglomerates, clays, and sands have been worked successfully under the basalt. The soil is rich, springs and bogs are over-saturated with water, and the alpine vegetation under the Snow Gums is profuse and varied, Daisies and Asters, Everlastings, the Mountain Shaggy Peas, Euphrasias, Craspedias, Rice-flowers, and Stylidiums lending brightness and variety to larger plants forming the scrub vegetation of the higher altitudes. Coming near to the summit of Hotham an unequalled panorama is revealed on every side. Mount Hotham, or "Baldy," 6,100 feet in height, is a splendid vantage point, its deepest slope being towards the Dargo River. On the north side stretches the Kiewa River valley, north-east the Cobungra valley, and north-west is the Ovens valley. Seven miles distant is Mount Feathertop, whilst Mounts Loch and Fainter are prominent peaks, and about ten miles away are seen the lofty plains of mighty Bogong. An interesting feature at the road-side near Mount Hotham is the presence of blocks of basalt, distinctly columnar in structure, pentagonal in form, and mostly about two feet long, concave at the one end and convex at the other. Some of these blocks are well preserved, others in various stages of decomposition towards the ultimate stage of clay. At one period these blocks, with others that have been disintegrated, were probably in their jointed structure one upon the other in organ-pipe formation, as in similar columnar basalt deposits seen elsewhere. Now, disjointed and overthrown, they are enriching the soil in their decay.

Just after passing round "Baldy," whilst looking at the

wonderful view past Razorback to Feathertop and down into the far depths of the valleys, around Feathertop swept fleecy cloud mists, which, filling the valley with their presence, rapidly rose before a rising wind, blotting out the landscape, and enveloping us so that we could see only about a dozen yards ahead. Then rain came, and our road around the south of Mount Smythe and along the western side of the fitly-named Mount Blowhard, where the road is narrow, and the descent on the valley side precipitously deep and dangerous, required in the circumstances our driver's most careful skill and attention. A pair of eagles perched on the edge of the road flew almost from under the horses' feet into the enveloping clouds. The view was completely obscured, and we were pleased indeed to see the Hospice nestling near the top of Mount St. Bernard. A hearty meal and a good fire warmed and cheered us. After tea, tempted by a fleeting glimpse of fine weather, we started out for further observation, but thick cloud and rain again came up and drove us back again. The rainfall at the Hospice is about 66 inches per annum.

In the morning we resumed our journey to Harrietville down the long, winding, but generally well-graded road. Although the weather was not propitious, we occasionally caught sight of the summit of Feathertop and other peaks whilst the mass of the mountain was invisible, and the timbered slopes and beautiful valleys were with us all the way. Approaching Harrietville, evidences of mining operations were seen in the tunnels in the sides of the mountains and the tailings heaps in some of the valleys. Harrietville is a pretty township on the Ovens. Beautiful trees grow in its streets and gardens. Here we found the devastation caused by dredging ever with us as we passed along the valley of the Ovens River, whose original beauty has been sadly marred by the operations. In addition, we soon noticed, all the way to Bright, the prevalence of that introduced curse, St. John's Wort, *Hypericum perforatum*, in full bloom, growing profusely everywhere—in good or bad soil, on valley or hill. Its eradication is a hopeless task. Another introduced plant growing with accelerated vigour is the Blackberry, *Rubus fruticosus*, choking the streams, strangling native vegetation, and harbouring rabbits and snakes. Nearing Bright, after passing mile after mile of the stone-strewn flats marking the dredges' destroying workings, we saw where, under the direction of the Forestry Department, laudable attempts were being made to hide, by tree-planting, the traces of the unsightly ravages which dredging has effected in this once beautiful valley. Quite a forest of healthy-looking conifers is growing over a considerable area. At another place the successful planting of Black Wattle on the denuded spaces

is observed. These are only oases in the desert of devastation, but worthy of repetition *ad infinitum* in the Ovens valley. In due course we reached Bright, in its picturesque and attractive surroundings. Here, as at Harrietville, lovely trees grow in the streets and gardens, walnut trees especially flourishing along the river flats.

Leaving Bright by train, we had a splendid view of the Buffalo Mountains, so popular a holiday resort, and we returned to the city carrying with us very pleasant recollections of the spaciousness, grandeur, and exhilaration of far-off mountain heights.

PART II. BOTANICAL NOTES, BY H. B. WILLIAMSON, F.L.S.

Most of the shrubs along the picturesque Bruthen to Omeo road were past flowering. These would make a fine show about two months earlier. There were, however, a few, notably Long-leaf Lomatia, Kanooka, and Christmas Bush, which brightened the outlook with their white or yellow blooms. Occasionally, on the sides of the cuttings, the small-flowered Cockspur, *Plectranthus parviflorus*, displayed its pretty pale flowers. The Grey Mistletoe, *Loranthus quandang*, was frequent on the trees over the track, and the feathery fruits of Clematis decorated many bushes. The only Acacia seen in bloom was the Late Black Wattle, *A. mollissima*.

A ramble along the Livingstone Creek at Omeo soon showed the hopelessness of getting much of the original vegetation, owing to operations of the gold-seekers, who have repeatedly turned over the soil on both banks, and left little but clear gravel. Amongst this gravel, however, the rather rare Bush Clover, *Lespedeza cuneata*, was found, a plant reminding one of a whitish-flowered Cape Broom, dwarfed and unbranched. The curious, hard-spined Anchor Plant, *Discaria australis*, is common around Omeo, but fruit only was found. Variety *parviflora* of *Daviesia latifolia* is also plentiful, fruiting. This form has very small leaves, not undulate or reticulate as in the common form. A very luxuriant growth of Dusky Scurvy Pea, *Psoralea adscendens*, was noted in some of the small gullies. About a mile from Omeo, along the road to Bright, a patch of the Heraldic Scotch Thistle, *Onopordon acanthium*, with its white blankety tomentum, is a prominent feature. This has long been naturalized in Victoria, but apparently has not spread as other thistles have done. Tufted Knawell, *Scleranthus diander*, can be seen on the edge of the old workings.

A walk along the Bright road for seven miles from Omeo, rising some 1,500 feet, was of interest, some fine views of the town and its surroundings being obtained. Growing in association were three leafless santalaceous plants—Pale-fruited

Ballart, *Exocarpus stricta*, Leafless Sour-bush, *Omphacomeria acerba*, and Dwarf Sour-bush, *Choretrum lateriflorum*, the two first-named being in fruit, and the last bearing small white flowers. The Rock Isotoma, *I. axillaris*, and flowering shrubs of Indigo, Showy Guinea-flower, and Curved Rice-flower, *Pimelea curviflora*, var. *alpina*, were frequent, the last-named being a much-branched shrub, up to three feet. Small-fruited Hakea, *H. microcarpa* was common, but I failed to find flat leaves on any of the bushes.

About seven miles from Omeo the poles of the electric line which once supplied Cassilis mine with current are still standing, and, along this, up some 500 yards, a patch of Woollybutt has been exploited for its excellent timber. This tree is *Eucalyptus Sieberiana*, the Silvertop of our "Census," which records *E. longifolia* as Woollybutt, a rare Victorian tree found only in the extreme south-east.

On the dry bed of Lake Omeo, at Benambra, little vegetation was to be seen, the only flower gathered being the Rosy Pelargonium, *P. Rodneyanum*, in a much-stunted state. On a dry sheep-grazed hill near the town were the Silverweed Lily, *Laxmannia gracilis*, and Variable Tic-trefoil, *Desmodium varians*.

Morass Creek, a strip of dark green, winds through the plateau, and consists of thickly-matted water-plants on which one could almost walk with a device like snow-shoes. Besides the common water-weeds—among which Purple Loosestrife and Pink Knotweed relieved the dark green—there grew the Floating Marshwort, *Limnanthemum geminatum*, with fringed yellow flowers. At the water's edge, also, two rare daisies were gathered—*Brachycome radicans* and *B. angustifolia*. In the Herbarium are specimens of both these, gathered in this locality by Baron von Mueller in 1853.

On "The Brothers," near Benambra, the only plants of interest found were the Mountain Gentian, *G. saxosa*, Mountain Cudweed, *Gnaphalium alpigenum*, Turquoise Berry, *Drymophila cyanocarpa*, and Pennywort Azorella, *A. Muelleri*. The last-named was in leaf only. On a creek seven miles north-east of Benambra, *Baeckea Gunniana*, in bloom, revealed itself by its strong perfume, and a few plants of *Epacris longiflora*, Fuchsia Heath, were noted without blooms.

From Benambra to Limestone Creek the forest consisted chiefly of Snow Gums, Black Sallee, *E. stellulata*, Broad-leaved Peppermint, *E. dives*, and Candlebark, *E. rubida*. There were patches of Swamp Gum and Narrow-leaved Peppermint and Woollybutt. The alluvial, rabbit-infested, grassy flats of Limestone Creek presented in some parts large patches of Alpine Didiscus, *D. humilis*, which appeared to be the only

plant that had successfully defied the rabbits, and which covered the flats with a carpet of white. Other plants peculiar to the North-East were *Pimelea pauciflora* and *Juncus falcatus*. At the Marble Quarries were seen some fine bushes of Alpine Aster, *Olearia alpicola*, and the Large-leaved Aster, *O. megalophylla*, was abundant along the stony track to the Cobberas. This track in places led through open grassy plains, and on the way many alpine plants, such as are common on the Buffalo Plateau, were gathered. A rare Pultenæa, *P. fasciculata*, was gathered here. Specimens of this plant have apparently not been sent to our Herbarium since Mueller brought it from the Cobberas in 1853. Austral Cord-rush, *Restio australis*, is common here, and was reported by our guide as causing much trouble to horses that nibbled it, by becoming fixed between their teeth.

After leaving our horses, the climb to the summit of the Cobberas was, from the botanist's point of view, the most interesting part of the trip. The way led up through weirdly gnarled and stunted Snow Gums, among beautiful bushes of Derwent Speedwell, *Veronica Derwentia*, Large-leaved Aster, Rosemary Everlasting, and Tasman Flax Lily, *Dianella Tasmanica*. Here and there were matted clumps of the alpine form of White Purslane, *Claytonia australasica*, which grew in the damp hollows, and on the rocky ledges Snow Daisies, *Brachycome nivalis*, and Silver Asters, *Celmisia*, attracted the attention. At the summit the Snow Gums presented some remarkably gnarled and deformed shapes, and attained a girth of 15 feet, though scarcely exceeding that in height. Under these stunted trees there was a thick growth of Tussock-grass, *Poa cæspitosa*, and Coarse Bent-grass, *Calamagrostis rudis*, interspersed with bushes of the lovely Alpine Mint-bush, *Prostanthera cuneata*, and an Alpine Aster, *Olearia subrepanda*, once considered as a form of *Aster stellulatus*. The curious alpine umbelliferous plants, *Aciphylla simplicicaulis* and *A. glacialis*, grew in abundance, especially the latter, the dense masses of which, with their heads of creamy flowers, were really beautiful. Sweet Holy-grass, *Hierachloa redolens*, with its panicles of shining golden spikelets, grew sparingly at the summit. Other alpine plants seen in bloom were Alpine Phebalium, *P. podocarpoides*, Violet Fleabane, *Erigeron pappochromus*, Mountain Shaggy-Pea, *Oxylobium alpestre*, Leafy Bossea, *Bossiæa foliosa* (many plants with ripe fruits, one only in full bloom), Alpine Rice-flower, *Pimelea alpina*, Pine Bottlebrush, *Callistemon pityoides*, Long Podolepis, *P. longipedata*, Mountain Mirbelia, *M. oxyloboides*, Thyme Heath, *Epacris serpyllifolia*, and Mountain Plum Pine, *Podocarpus alpina*. Many other plants which bloom near Melbourne in October

were here seen at their best—Fringe-lilies, Chocolate-lilies, Myosotis, Stackhousias, Indigo, Pimeleas, Buttercups, Violets, Flax, Trigger-plants, Billy Buttons, Bluebells, Veronieas—and one could not fail to be struck with the wonderful brightness of colouring these flowers display in high altitudes—so much so that one has sometimes failed to recognize an old friend when presented in a more showy dress.

Having a spare day at Omeo, I determined to try to reach the rare *Eucalyptus neglecta* of Maiden, which had been reported from the "head of the Livingstone Creek, 20 miles from Omeo." Hearing from a scrub-cutter I chanced to meet that a curious kind of gum-tree grew near his camp on the Cobungra estate, I arranged with a resident, who agreed to drive me to within a mile or two of the camp, about 18 miles out. Accompanied by the youngest of our party, Mr. Allen, who, by the way, is a keen observer of the plants, and helped materially in the collecting, I found the object of my inquiries growing on Spring Creek, Cobungra, and gathered a good supply—evidently the first specimens brought to Melbourne since Howitt sent a few scraps in 1882. It grows so densely along the creek that even a wallaby has difficulty in making its way through it. Our "Census" gives the vernacular "Neglected Gum," but I would suggest, as more appropriate, "Omeo Gum." At the same locality we gathered some very fine mushrooms about six inches across, which were remarkable for their regular and uniform shape.

Orchids.—Four only were met with—*Dipodium punctatum*, at Omeo; *Chiloglottis Gunnii*, at "The Brothers"; *Pterostylis alpina*, at Cobungra; and a Caladenia, probably an alpine form of *C. carnea*, on Cobberas.

Ferns.—Three only were seen—*Blechnum penna-marina* (*Lomaria alpina*), at Cobungra, under *Eucalyptus neglecta*; *Asplenium trichomanes*, among rocks at Limestone Creek; and the common *Aspidium aculeatum* at the summit of Cobberas.

Birds.—With the assistance of Mr. Hughes I am able to record 43 species. Wonga Pigeons were heard frequently, and three or four were seen, one of which allowed us to approach near enough to get a fine view of the bird. Of Honey-eaters, the White-naped, the White-plumed, the two Wattle-birds, and the Friar-bird were seen. On the high grassy plains Spur-wing Plover were numerous, and on Morass Creek, at Benambra, Coot, Black Duck, Teal, and Swan were noted. Bald Coot waded along the edge, and a few of the beautiful Sheldrake (Mountain Duck) rose from near by. On a road cutting 1,500 feet above the town of Omeo, early in the morning, we watched a pair of Gang-Gang Cockatoos at their morning meal

of Silver Wattle seeds. They fed unconcernedly 20 or 30 feet away from us. Eagles were very numerous, and one which I followed dropped the rabbit it was carrying, and watched me from a short distance as I examined its catch. A Satin Fly-catcher entertained us by an exhibition of fly-eating, its meal being apparently a dragon-fly, which it appeared to have deprived of its wings. It seemed a great meal for so small a bird. Grey Bell-Magpies and White-winged Choughs flew around us, uttering their harsh croaks or mournful whistles. Fantails (two), Cuckoo-Shrikes, Blue Wrens, and Wood-Swallows were frequently met with, while Crimson Parrots and Rosellas seemed anxious for us to notice them. The birds we heard but did not see were Bronze-wing Pigeons, Lyre-birds, Frogmouths, Boobook Owls, Bronze and Pallid Cuckoos, and the Oriole.

A.A.A.S.—The report of the fifteenth meeting of the Australasian Association for the Advancement of Science, held in Melbourne in January, 1921, has been issued. Unfortunately, the funds available only sufficed for printing the presidential addresses in the different sections, the papers read being listed under their titles, with references to where they have been or will be published. This curtailment is greatly to be regretted, but was inevitable owing to the high cost of printing.

"CRITICAL REVISION OF THE EUCALYPTS."—The recently-issued parts (52 and 53) of this valuable work by Mr. J. H. Maiden, I.S.O., F.R.S., Government Botanist of New South Wales, advance the total number of species of Eucalyptus described to 309. Among the latest is *E. Studleyensis*, described from a tree observed by Mr. A. D. Hardy in Studley Park, Kew. It is, however, regarded by Mr. Maiden as a hybrid, and is perhaps a unique specimen. The listing of species is now nearing completion, the author expecting to reach 350 with the final description. In recent parts considerable space has been devoted to comparisons of the growing tree, bark, timber, &c., and the vexed question of hybridization is now being considered, with the result that Mr. Maiden is of opinion that hybrid eucalypts have undoubtedly been found in various parts of Australia, while artificial hybrids have been raised by Mr. C. J. Weston, Afforestation Officer, Federal Territory, Canberra. Accidental hybrids have been recorded from Algerian plantations of eucalypts. Among those which have been named as species, but which may prove to be hybrids, are *E. calophylla*, *E. Consideniana*, *E. Kitsoniana*, and *E. neglecta*. The last-named is referred to by Mr. Williamson on the preceding page.

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The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

Published 6th July, 1922.

Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	25
Annual Report	26
Notes	39, 40

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1922.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 10th JULY, 1922.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Miss Munro, Anzac Hostel, North Road, Brighton.	Miss A. V. Fuller.	Mr. C. Oke.
Mr. G. C. Hodgson, Post Office, Mentone South.	Mr. F. Pitcher.	Mr. E. E. Pescott, F.L.S.
As Country Members—		
Miss Mary McIntyre, "Laggan," Merino.	Mr. M. Moodie.	Mr. C. Oke.
Mr. A. J. Williamson, Bank of Victoria. Dunolly.	Mr. J. A. Kershaw, F.E.S.	Mr. E. E. Pescott, F.L.S.
As Associate Member—		
Mr. R. E. Gray, Dresden Street, Heidelberg.	M. C. Oke.	Mr. F. Chapman, A.L.S.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

   By Mr. P. C. Morrison—"A Simple Study of our Common Serpulid."

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICE.

The new year commenced on 1st May. Subscriptions for 1922-3 must be paid before 12th June in order to qualify for voting at the annual election. Any unpaid subscriptions for 1921–2 should be forwarded to the Hon. Treasurer **at once.**

Any change of address should be notified to the Hon. Secretary at once.

The Victorian Naturalist.

Vol. XXXIX.—No. 3. JULY 6, 1922. No. 463.

FIELD NATURALISTS' CLUB OF VICTORIA.

The forty-second annual meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th June, 1922.

The president, Mr. F. Chapman, A.L.S., occupied the chair, and about sixty members and visitors were present.

CORRESPONDENCE.

From Mr. J. A. Kershaw, F.E.S., thanking members for again nominating him for office on the committee, and saying that, as he had held office for more than twenty-five years as secretary, vice-president, president, or member of committee, he considered it time he stood aside and made room for a younger member.

On the motion of Messrs. Oke and Hardy, it was resolved to ask Mr. Kershaw to allow his nomination to stand.

REPORTS.

In the absence of the leader, Mr. J. A. Kershaw, F.E.S., Mr. C. Daley, F.L.S., gave a short account of the visit to the National Museum on Saturday, 13th May, when there was a good attendance of members. Mr. Kershaw invited the party to follow him to the bird room, where a large number of bird-skins were displayed for examination. After some general remarks about birds, illustrated by references to the skins displayed, he explained the anatomy of a bird's wing by means of a mounted skeletal wing. Some time was then given to the "H. L. White Collection" of Australian bird-skins, after which a visit was paid to the insect room, where a number of drawers of butterflies and beetles were examined. Altogether, a very interesting two hours or so was spent at the Museum, which, considering the limited staff, is in a high state of efficiency.

A report of the excursion to Evelyn on Monday, 5th June (King's Birthday), was given by one of the leaders, Mr. C. Oke (his co-leader, Mr. C. L. Barrett, C.M.Z.S., being unable to be present at the excursion owing to ill-health). Considering the time of year (midwinter), the attendance was very satisfactory, nearly forty being present. The party walked along the now disused Lilydale water-race towards Wandin as far as the cascades on the Olinda Creek, returning to the station by the Wandin road. Though there is a wealth of shrubbery, &c., along the creek, flowers (excepting the native heath) were scarce. A number of insects, spiders, &c., were also collected,

and will form the basis of further remarks on a later date. Some of the party continued their walk to Lilydale, rejoining the train there.

ELECTION OF MEMBERS.

On a ballot being taken, Miss C. Morres, Thanet-street, Malvern, and Mr. Albert Bishop, 8 Dudley-street, East Caulfield, were elected ordinary members, and Mr. W. C. Tonge, Eltham, as a country member of the Club.

ANNUAL REPORT.

The hon. secretary, Mr. C. Oke, read the forty-second annual report for the year 1921–2, which was as follows :—

"To the Members of the Field Naturalists' Club of Victoria.

"Ladies and Gentlemen,—In presenting the forty-second annual report of the Club for the year ended 30th April, 1922, your committee desires to thank members for their hearty support, and to congratulate them on the successful results attained, during the past twelve months.

"Commencing the year with 259 members and associates on the rolls, there were elected 27 ordinary, 4 country, and 3 associate members. Deaths numbered 5, and resignations 6, leaving a membership of 282. It is with regret we have to record the deaths of several well-known members. In July there occurred the deaths of Mr. J. P. M'Lennan, of the Burnley Horticultural Gardens, and Mr. E. H. Lees, C.E., F.R.A.S., of Mallacoota. In October Dr. Drake, of Beaconsfield, died, and during January Mr. F. Smith, of Noorat, and Mr. H. Young, of Meredith, passed away. To the relatives and friends the Club offers its deepest sympathy in their loss.

"The monthly meetings have been held regularly, with an average attendance of between 60 and 70 members and friends. Fourteen papers have been read and one lecture given during the year, and these, together with the discussions that have followed, have proved very entertaining and instructive. Such diverse subjects as anthropology (2), botany (6), entomology (3), geology (1), and physiography (2) have been successfully treated. The following papers and lectures have been delivered :—In May—'Some Aboriginal Stone Implements,' by Dr. G. Horne, V.D. ; in June—'A Description of a New Trymalium,' by Mr. J. W. Audas, F.L.S. ; in July—'An Entomologist in Southern Queensland,' by Mr. F. E. Wilson ; in August—'The Gippsland Lakes Country : the Physiographical Features,' by Mr. T. S. Hart, M.A., and 'A Day's Beetle-Hunting at the Lerderderg,' by Mr. C. Oke ; in September—'Forestry,' by Mr. Owen Jones. In October a Mueller Com-

memoration Night was held, it being the twenty-fifth anniversary of the death of Baron Sir F. von Mueller, K.C.M.G., when three papers were given dealing with the various aspects of his life and work. These were :—(*a*) 'A Sketch of Mueller's Life,' by Mr. C. Daley, B.A., F.L.S. ; (*b*) 'Mueller's Published Works,' by Mr. E. E. Pescott, F.L.S. ; (*c*) 'Mueller's Botanical Exploration of Victoria,' by Mr. F. G. A. Barnard. In November—'Notes from the Mallee : Botany,' by Mr. H. B. Williamson ; in December—'A Further Contribution to the Alpine Flora of Victoria,' by Mr. A. J. Tadgell, and 'Notes on the Caper Butterfly,' by Mr. C. J. Cole ; in January—'Notes on the Geology of the Mallee,' by Mr. F. Chapman, A.L.S. ; in February—'Notes from the National Herbarium,' by Messrs. J. Tovey and F. P. Morris ; in March—'A Trip to the Sources of the Murray River,' by Messrs. C. Daley, B.A., F.L.S., and H. B. Williamson ; in April—'Aboriginal Scrapers,' by Dr. G. Horne, V.D. Most of the papers read have appeared in the Club's journal.

"The excursions of the Club have been well maintained during the year, the popularity of these outings being evident by the numbers who have attended them, and who, it is to be hoped, have derived both profit and pleasure, which combined constitute knowledge. Reports of excursions do not, as a rule, contain much, if any, evidence of actual observation done in the field, which is much to be regretted, for it is only by so doing that we can hope to live up to our name—field naturalists. A number of excursions have been made on Saturday afternoons to places of interest around the metropolis, while whole-day trips have been made to the following places :—Werribee Gorge, Paradise, Healesville, You Yangs, Frankston, Tooradin, Warragul, and Belgrave, and trips of longer duration to Bendigo, Walhalla, and Toolangi.

"In June last this Club, in conjunction with the Microscopical Society, held an exhibition of natural history specimens in the Melbourne Town Hall. This was opened by His Excellency the Earl of Stradbroke, who expressed his delight at finding that Melbourne had enough people with a scientific inclination to hold such a fine exhibition. The financial result of this exhibition was the addition of £23 to the Club's funds, the Microscopical Society receiving an equal amount. The committee desire to thank all those who gave of their time so freely and worked so well to make this exhibition the success it was, and would like to particularly thank Miss Gabriel and ladies for attending to the refreshments.

"The annual exhibition of wild-flowers was held in the Athenæum Hall on Tuesday, 27th September, and was opened by Her Excellency the Countess of Stradbroke. The Club

was again unfortunate in having to hold its flower show, for the second year in succession, in a small hall, but expects to be in a better position in future. To all those who helped so heartily in making this event the great success it was the committee extends its very best thanks, and more particularly to the ladies, who did such good work. By this exhibition £50 was added to the Club funds, which must be considered very good indeed.

"The Plant Names Committee is still pursuing its labours, and has nearly completed the work of revising the vernacular names. The task has been more difficult than the ordinary member would think, and the question of deciding what form the publication should take has required considerable thought. However, with £150 in hand for publishing, there should now be no difficulty in securing a publisher as soon as the final revision is completed.

"The thirty-eighth volume of the Club's journal, the *Victorian Naturalist*, has been published, and, under the able editorship of Mr. F. G. A. Barnard, still holds a prominent place among kindred publications. That it is favourably regarded in other countries is shown by the frequent requests that are received to exchange with kindred societies and institutions. Your Committee desires to place on record its appreciation of the untiring devotion to the work of producing the Club's journal displayed by its honorary editor for so many years.

"To Mr. P. R. H. St. John, who has had charge of the Club's library for some considerable time, the committee would extend its very best thanks for the capable way in which he has carried out the duties.

"Another office-bearer who has served the Club well is Mr. F. Pitcher, to whom all are deeply indebted for the very thorough and painstaking way in which he has kept the accounts.

"The finances of the Club are once more in a sound position, and this despite the high cost of printing, postage, &c. The treasurer's report shows that we have a credit balance of £219 4s. 11d. in our ordinary account, besides £150 set aside for the printing of the 'Plant Names List.'

"In conclusion, your committee desire to express their thanks to members generally for their loyalty and assistance in carrying on the work of the Club, and trust they will extend it to the incoming committee.

"On behalf of the Committee,

"F. CHAPMAN, *President.*

"CHARLES OKE, *Hon. Sec.*

"Melbourne, *12th June*, 1922."

The reception of the report having been carried, it was moved by Mr. E. E. Pescott, F.L.S., and seconded by Mr. G. Coghill, that the report be adopted, the latter remarking on the continued success of the Club and its growing popularity. The motion, on being put, was carried unanimously.

FINANCIAL STATEMENT.

The hon. treasurer (Mr. F. Pitcher) presented the financial statement for 1921–2, which was as follows :—

RECEIPTS.

To Balance, 30th April, 1921									£32	19	10
,, Subscriptions—											
Ordinary Members	£123	9	0								
Country Members	34	0	6								
Associate Members	3	2	6								
				£160	12	0*					
,, *Victorian Naturalist*—											
Subscriptions and Sales ..	10	9	6								
Advertisements	3	0	0								
Reprints	2	17	10								
				16	7	4					
,, Sales of Badges				1	6	3					
,, Donations—											
Publishing Fund				13	17	6					
,, Interest—Savings Bank and War Loan ..				7	12	8					
,, Discount				0	0	8					
									199	16	5
,, June Exhibition—											
Admissions				67	19	0					
Donation				0	10	0					
Sales of Plants and Flowers				10	3	3					
Refreshments				14	0	0					
Refund by Microscopical Society				2	8	0					
									95	0	3
,, Wild-flower Exhibition—											
Admissions				138	8	0					
Sales of Plants and Flowers				42	14	1					
Refreshments				14	8	0					
									195	10	1
									£523	6.	7

* Subscriptions :—Arrears, £19 ; 1921–2, £132 17s. ; advance, £8 15s.—total, £160 12s.

EXPENDITURE.

By *Victorian Naturalist*—											
Printing	£122	15	5								
Illustrating	7	10	11								
Free Reprints	8	2	8								
Reprints Charged	2	8	4								
				£140	17	4					
,, *Victorian Naturalist*—											
Wrapping and Posting				19	3	5					
,, Rooms—Rent and Attendance				13	10	0					
Carried forward ..				£173	10	9					

Brought forward					£173	10	9				
By Library—											
Periodicals	£2	5	0								
Insurance	0	7	0								
					2	12	0				
,, Hire of Lantern					3	0	0				
,, Printing					16	5	6				
,, Postages, &c.					7	0	6				
								£202	8	9	
,, June Exhibition—											
Hall and Attendance, &c.					17	10	4*				
Printing and Advertising					7	10	6				
Purchase Flowers and Plants					4	4	10				
Microscopical Society—Part Proceeds ..					25	1	10				
								54	7	6	
,, Wild-flower Exhibition—											
Hall and Attendance, &c.					24	16	9				
Printing and Advertising					8	2	0				
Purchase of Flowers and Plants					12	4	8				
								45	3	5	
,, Deposit on Rent of Hall for June Exhibition, 1922.. ..								2	2	0	
								304	1	8	
,, Deposit in Savings Bank					175	0	0				
,, Balance in Savings Bank					37	12	8				
,, Balance in London Bank					6	12	3				
								219	4	11	
								£523	6	7	

* Rent of hall, £18, included in previous balance-sheet.

F. PITCHER, *Hon. Treasurer.*

23rd May, 1922.

Audited and found correct.

ALFRED J. TADGELL, A. G. HOOKE, } *Auditors.*

23rd May, 1922.

The following statement of assets and liabilities was also read :—

ASSETS.

Balance Savings Bank and London Bank ..	£219	4	11
War Loan Bond	20	0	0
Arrears of Subscriptions (£60), say	30	0	0
Badges on hand	1	17	6
Library and Furniture (Insurance Value) ..	150	0	0
Deposit in Savings Bank for Plant Names Publication	150	0	0
	£571	2	5

LIABILITIES.

Subscriptions paid in advance	£8	15	0
Donation to Char-a-banc Excursion Fund ..	10	0	0
Deposit for Plant Names Publication	150	0	0
	£168	15	0

On the motion of Messrs. E. E. Pescott, F.L.S., and G. Coghill, the statements were received and adopted.

ELECTION OF OFFICE-BEARERS.

On a ballot being taken for the position of president, Mr. C. Daley, B.A., F.L.S., was duly elected; for two vice-presidents, Messrs. F. Chapman, A.L.S., and E. E. Pescott, F.L.S., were elected. The following office-bearers, being the only nominations, were declared duly elected:—Hon. treasurer, Mr. F. Pitcher; hon. librarian, Mr. P. R. H. St. John; hon. editor, Mr. F. G. A. Barnard; hon. secretary, Mr. C. Oke; hon. assistant secretary and librarian, Mr. H. B. Williamson.

On a ballot being taken for five members of committee, Messrs. C. L. Barrett, C.M.Z.S., J. Gabriel, J. Searle, C. S. Sutton, M.B., and A. J. Tadgell were duly elected.

A vote of thanks to the auditors was carried by acclamation, on the motion of Messrs. Pescott and Daley.

On the motion of Messrs. G. Coghill and A. D. Hardy, a hearty vote of thanks was accorded to the past office-bearers.

The newly-elected president, Mr. C. Daley, B.A., F.L.S., returned thanks for the honour done him.

PRESIDENTIAL ADDRESS.

The retiring president, Mr. F. Chapman, then delivered a presidential address, which was as follows:—

DEAR FELLOW-MEMBERS,—

In addressing you to-night, at the close of this year's very pleasant association, I would like to congratulate you as a Club in having so many indefatigable workers among its members, helping so largely to keep the society in the forefront with similar institutions. My own personal debt to the Club is very great, especially in regard to the valuable insight into Australian outdoor life since when, twenty years ago, as a new chum, I first joined in the excursions.

Perhaps one of the hardest tasks the committee has to undertake is the framing of the excursions programme. But this work is always very much facilitated when members notify the secretary of any interesting observation grounds or spots newly opened that may afford something for study in any of the subjects which come within the scope of the Club. An important point to bear in mind in any field club is the endeavour to maintain the balance of the various branches. So that no one section should unduly predominate, it might be worth arranging for a quarterly programme—a method which works very well in other societies. Certainly things have improved since the time when our former president, Dr.

T. S. Hall, remarked that "Once the members were all for orchids; later on there was an attack of microscopic fever; and now the air is full of feathers."

In a club such as ours papers submitted for reading should not be too technical. It was a famous French mathematician and physicist who said that "no discovery was really important or properly understood by its author unless and until he could explain it to the first man he met in the street." The popularization of science works both ways. It helps the scientist to clarify his own knowledge, and at the same time enables the uninitiated to enjoy that which he has some right to. And moreover, when the movement begins to revolve in a virtuous circle, the man in the street may be so well informed as to vote for a political head which will respond to the demands for the proper recognition of science. To be popularly scientific does not imply the use of loose or inaccurate terms, nor does it allow any slipshod description. It is enough to quote the names of Professors J. Arthur Thomson, L. C. Miall, and Sir E. Ray Lankester, and of Drs. Alfred Russel Wallace and A. E. Shipley, to show that scientific accuracy and clear popular exposition can legitimately join hands; and so the uninitiated but interested followers of science can share in the wondrous secrets of earth, air, and sea.

On these lines the committee are now intending to introduce, periodically, descriptive papers on common Victorian natural history subjects, and one of these will shortly be given on "Marine Worms." Other subjects that suggest themselves might be on "Spiders and Their Webs," "Common Volcanic Rocks," "Shells in Shore Sand," "Environment of Caterpillars and their Choice of Food Plants," "Snakes and Lizards," "Stones of the Street," "Birds in Relation to the Farmer and Orchardist," "Plant Association."

One good result sometimes accruing from the work of a field club is the discovery of an occasional enthusiast who desires to take up some branch of nature study. Many of our older members would be only too pleased to put these young recruits in the way of future work and to further their studies, for they recognize the possibility of a latent Darwin coming to light in the natural history club.

Many of our common marine objects still require elucidation in the hands of workers who will devote themselves to steady observation and research. In this connection one might point out that the important groups of the Ostracoda, the Foraminifera, and the Polyzoa are still wanting some more earnest students, and in regard to the two first-named sections I would be only too glad to further their work in reference to literature and technique. When a request for special work

is made, one often hears the reply, "I am too busy." Yet I call to mind how my old friend Joseph Wright, of Belfast, in the midst of a busy life as a city grocer, found time to do a vast amount of work on the Irish Foraminifera, both fossil and recent. A waiter in a hotel at Deal, a fashionable watering-place in Kent, in the midst of a strenuous calling, excelled in the preparation and mounting of seaweeds as microscopic objects. W. H. Shrubsole, of Sheppey, England, was a high authority on the fossils of the London clay, and discovered the pyritized diatoms in the Eocene of his local clay beds. I remember calling upon him during business hours at his grocer's shop and enjoying a five minutes' chat upon microscopic fossils. As if the grocery line is conducive to nature study, let me cite another enthusiast, Benjamin Harrison, of Ightham, in Kent. He it was who discovered and explored the subject of the "Old Brownies," the eoliths of the South Downs, which are now accepted by nearly all anthropologists as veritable artefacts. Our late friend and fellow-member Mr. J. H. Young, whilst following the occupation of farmer and grazier, found time to do much good work in palæontological discovery, which will hand his name down to future generations as that of a particularly gifted collector of small and often obscure fossil forms.

As a corollary of this medley of observation of a domestic character, I would like to impress on members, and especially the younger ones, the value of taking notes. Time and again all of us have come upon certain phases of life—curious incidents and strange occurrences in the field—but they soon pass from mind. Once cultivate the advice of Captain Cuttle—"When found make a note of"—and the habit will prove of the greatest value as the years go on.

And now, may I give you some observations and musings written down this year whilst on holiday at Torquay, which I entitle

"'Twixt Bass Strait and Southern Ocean."

In the dimly remote past the shore-line which bounds sea and land was ordained to be the wrestling-ground for all living things, and so it has, in a measure, continued to the present time. Perhaps it is this ancestral relationship which exerts upon some of us a magnetic attraction towards our primeval dwelling-place of shore and cliff. Here we find the adjustment-line of crumbling crag and consolidating sea-bed. The rocky framework, conforming to natural laws, exhibits many lines of beauty, and no more entrancing picture can be imagined than a glimpse of the ocean,

"Purple with white crest blended,"

through a naturally-formed rock-arch, or framed between cliff and jutting rock-stack. (See plate i.)

Chesterton says "the most beautiful part of every picture is the frame." The so-called "boundless sea," from the onlooker's point of view, seems to be held in by a partial framework of shore-line, and the picture of the ever-changeful ocean is certainly enhanced by its setting. The fringing sandy beaches, in turn, are followed by a line of frowning headlands and beetling cliffs, which are suggestive both of power and repose; and these by undulating dunes, which, with their graceful lines, form another part of this framework. Much of the beauty of this seaboard of the Southern Ocean lies in its diversity of sculpture and coloured inlays, which, like a well-chosen frame, sets off the picture it surrounds.

Alternations of Coastal Levels.

One of the contributing factors of the wonderful scenery of many parts of the Victorian coast-line is the instability of the coastal rock-formations, whether granite bluff, limestone headland, or marly cliff. But if Nature takes with one hand she liberally disburses with the other, and the see-saw principle of geological action—or, in other words, the compensatory movements of the heaving bosom of Mother Earth—is clear to all who have studied the rudiments of geology. Should a boring be put down in an estuarine country in order to test for a solid foundation, say for bridge-building, the chances are that one would encounter vast thicknesses of mud, sands, and pebbles which have been originally laid down near to sea-level. Why are these shallow-water muds and sands now found at such great depths?—such, for example, as the old river muds of the Mitchell and Nicholson Rivers, which, in the latter case, were penetrated when pile-driving for the railway bridges. The only possible explanation is supplied by the conception of a mobile earth-crust which will give way or sag down on being overloaded—in this case by river sediment. Such downward movement is often followed by periodic lava-flows until equilibrium is again established. Much the same thing takes place when the distracted cook allows the fruit-juice to boil over the pie-crust. In the geological event the weight and friction caused by the slipping of the earth's crust is the cause of the boiling-over of volcanic lavas. When one part of the coast subsides it is only natural to expect that other parts will be elevated, owing to earth waves induced by lateral pressure. And thus one portion of the coast-line, and sometimes the land-surface behind, will rise, whilst the adjacent part will sink, even below the sea-level. In one case we may have a submerged river delta on which the sea encroaches, as in Port

PLATE I

F. C. *Photo.*

BIRD ROCK AND CLIFFS.—WHERE CLIFF AND DUNE MEET.

PLATE II.

S.W. OF BIRD ROCK.—AN UPRAISED SEA-BED.

F. C. *Photo.*

Phillip Bay, and in the other headlands, rolling downs, and high cliffs, such as we may notice along the eastern side of the Otway coast as far as Torquay—that particular part of Victoria which has suggested the remarks that follow.

Coastal Folds and Convulsions.

As we

> "Saw the great rollers sunder,
> Rainbow-wreathed, at our feet;
> Heard, with a ceaseless thunder,
> Earth and the ocean meet,"

how few of us realized that the old sea-bed has risen along the coast-line like a huge leviathan from the vasty deep! From Cape Otway to the Bird Rock cliffs, south of Torquay, this emergence is seen in the beetling cliffs, some 150 to 200 feet high. That some of this upheaval, together with local faulting, has taken place within moderately recent times is proved by the following observations:—At Jan Jue Creek there is a sand-bar at the mouth, which in February, 1922, was 7 feet above high-water mark. Forty feet above this is found a covering, over the beds higher up the creek, of late Pliocene ironstone gravel. This was probably laid down in the Kosciuskean period, when the land was undergoing peneplanation. Now, at Bird Rock cliffs, 50 or 60 chains to the south-west, the same ironstone gravel occurs at the summit, 150 feet above high-water mark, showing an uplift by both faulting and folding of over 100 feet. (See plate ii.)

At Airey's Inlet there is the old Miocene bed, formed of the remains of sea-urchins, sea-mats, and shells embedded in sandrock, and now elevated as an upraised deep-sea formation. The carbonaceous beds of Anglesea show how near to a lignite these sediments approach. Here the higher beds of the cliff contain some evidence of coast-line conditions, for they practically oscillate between a marine and a terrestrial series; some of the layers of chocolate clay contain branching, stem-like markings picked out in salts of iron, and often of a bright sulphur-yellow colour.

In the Mallee these basement beds have been found to be either of the nature of lignite or to consist of carbonaceous sands. The Moorlands lignite field in South Australia, near the Victorian border, is due to accumulated vegetation laid down at this stage. Extensive boring in the Mallee and the Riverina may yet reveal payable deposits, for there the conditions are similar. These beds would be younger than that of the coalfield of Coorabbin, New South Wales, which appears to belong to the same horizon as the Collie field in Western Australia.

Proceeding towards Point Addis, the beds, owing to an

arched fold, are succeeded by a polyzoal and sea-urchin-filled limestone. Towards Torquay a strong anticlinal or arch fold occurs, where these Miocene polyzoal rocks are bent over the top of the cliff, and so, gradually passing down to tide level, finally disappear. These are followed farther along by quite recent sand-dunes. And thus we reach this area of subsidence, a base-levelled and sinking country, which is in places

> "A boggy Syrtis—neither sea
> Nor good dry land."

At intervals it continues practically to the East Gippsland coast, with the exception of a few minor elevated areas, as at Cape Schanck, Flinders, Kilcunda, and Bairnsdale.

Sand Dunes, Old and New.

Among the most striking features of the Victorian coast are the lines of high sand dunes. So remarkable are these that a geologist from England stated that he had not noticed anything to compare with them except those of the Arabian coast. By watching the incessant sand-drift of the dunes on a breezy day one may learn a wonderful lesson in earth-sculpture. The grains of sand, borne on the wind to the highest point formed, end their contest against gravitation, and then precipitately fall; hence the long slope and the steep of a sand ripple. The formation of the ripples, of which the sand dune is a gigantic example, is an interesting phase of Nature's handiwork. At times man steps in and frustrates the ultimate removal of the dune as it travels with the varying winds by planting marram-grass to fix it to the spot. Were it not for systematic grass-planting the dune might cause wholesale destruction inland, overwhelming gardens and even houses.

All along the ages we find evidences of the existence of dunes, for the cross-bedded freestones of the Devonian and Jurassic formations were laid down precisely as were those of Barwon Heads to-day. This in itself is a crushing rejoinder to the "catastrophists," who would maintain that past episodes in earth-building were always spasmodic and phenomenal. Borings in the Mallee have already shown that many years ago dunes formed part of the landscape of the Murray Gulf Region, for fragments of dune-rock have been brought up by the drill from varying depths. The old drowned delta of the Port Phillip Basin has also rendered remarkable evidence through the boring at Sorrento, where it was proved that dune upon dune, alternating with mud-flats filled with the little bivalved *Spisula*, are piled up in that spot to the thickness of 800 feet.

Fossilized Coastal Scrub.

Where dunes are forming, we may notice trees and plants

being overwhelmed by the sand. Naturally, the remains of *Banksia*, or Native Honeysuckle, and Tea-tree, being the commonest forms of coastal vegetation of a stronger growth, will be found well represented in the old dune-rocks. Such is the case on the Brighton and Black Rock beaches, where the iron-sand is the old forerunner of the modern dunes. Here may be seen, as Braille characters standing out in relief on a cartridge page, the compressed, scaly stems of prehistoric Banksias, with their fruits; before now the latter have been taken for fossil cucumbers!

When Darwin, voyaging in the *Beagle*, came into King George's Sound, he noticed, at Bald Head, the sand-encrusted shrubs; but it was not until Moseley, of the *Challenger*, described the formation of the encrusted bushes of the Cape Town sand-dunes that a concise account of them was published. In all stages of their encrustation these gaunt stems of past vegetation stand out—from the sand-coated stem to those in which the enclosed stem is decayed and washed away and the interior solidified. The organic acid derived from the decay of the stem plays an important part in helping to dissolve the limy sand, which is afterward cemented by the mineral solution as a crust around the stem. The same process takes place in the Sorrento dunes, and this was fully described by Dr. T. S. Hall in this journal for 1901.

The Sorrento Peninsula is largely covered with the old dune-rock which was heaped up some thousands of years ago. The age of this rock is approximately fixed by the finding of marsupial remains embedded in this ancient dune; they are referred to the extinct giant kangaroo, Palorchestes, whose somewhat formidable name, although signifying "ancient dancer," is perhaps hardly applicable to such a heavily-built creature.

It was with some interest that we lately found a patch of similar ancient dune-rock to the south-west of Bream Creek, and, what was perhaps more interesting still, a lagoon deposit of travertin resting upon it, pointing to the former outflow of springs. Continuing along this part of the coast, not far from Spring Creek, Torquay, there is another remnant of this old dune-formation, left in spite of the gnawing action of the tides of ten thousand years. It is about fifty yards in extent, and shows also the banded travertin deposit laid down by springs and lagoons which have long since disappeared. At Point Roadknight there is a very extensive section of this old dune-rock, in places etched and corroded into the most fantastic fairy caverns. From the position of this sculptured and castellated dune-rock, as it lies exposed to the beat of the tide against the massive Anglesea cliffs, it is unquestionably

only a small remnant of what once formerly existed. We can thus picture how extensive was this coast to seaward in former times, dating back possibly as much as ten thousand years ago.

NATURAL HISTORY NOTE.

TERMITES AND ANTS.—Mr. J. A. Hill, of Golton South, *via* Lubeck (N.W. Victoria), contributed a note relating his experiences.

EXHIBITS.

By Mr. H. Clinton.—Coccidæ (scale insects)—*Eriococcus coriaceus*, Mask., Opisthoscelis, sp. (?), *Ascelis præmollis*, Schrader, from eucalyptus; *Dactylopius aurilanatus*, Mask., from Native Cherry; Psyllidæ (lerp insects)—*Spondylaspis eucalypti*, from eucalyptus—collected on Evelyn excursion, under microscope. Mallophaga (bird parasites), collected by Mr. C. Oke from Edward Lyre-bird, *Menura novæ-hollandiæ edwardi*, Chisholm, at National Museum, Melbourne, 13/5/22—(*a*) *Degeeriella menurælyræ*, Boinde, (*b*) *Menopon menura*, Le Souëf and Bullen; also larva of *Notonomus phillipsi*, from Evelyn excursion, under the microscope.

By Mr. A. D. Hardy.—New species of eucalyptus, *E. studleyensis*, Maiden, from Studley Park, Melbourne, and photograph of same; photograph of Silver Wattle, 32 feet high, on summit of Blacks' Spur; sphagnum moss, from pool in Otway Ranges, collected by Mr. E. H. Hatfield.

By Mr. L. Hodgson.—Specimen of *Leptospermum scoparium*, var. *grandiflorum rosea*, grown from seed found at Berowa, N.S.W.; a rare variety, not recorded since 1817, when it was grown in England from seed found in New South Wales.

By Mr. C. Oke.—Twenty-five species of Coleoptera, including several undescribed species, collected on Evelyn excursion; also spiders and phlangids.

By Mr. E. E. Pescott, F.L.S.—Specimens of two blue-fruited Eugenias growing at Melbourne Botanic Gardens—*E. oleosa*, F. v. M. (Queensland), and *E. cyanicarpa*, F. v. M. (New South Wales).

By Mr. F. Pitcher.—Puff-balls, *Mitremyees fusca*, Berk.—beautiful crimson-coloured heads when growing, and with discharge of powder on pressure; collected on Easter excursion at Toolangi.

By Mr. A. E. Rodda (on behalf of Geological Survey of Victoria).—Slates, showing coloured markings due to oxidation, from Heathcote district.

By Mr. A. L. Scott.—Rocks from near Mount Cook Hermitage, New Zealand; water-worn pebbles from same locality; specimens of moraine collected from the surface of the Great

Tasman Glacier, near Mount Cook, New Zealand ; photographs of same localities.

By Mr. A. J. Tadgell.—Seed-pod of a rare Victorian garden escapee, but also found in New South Wales and Queensland, native of valley of the Mississippi, U.S.A.—*Martynia proboscidea*, Elephant's Trunk.

By Mr. A. J. Tadgell (on behalf of Mrs. Coleman).—Fresh blooms of orchids, *Corysanthes fimbriata*, Fringed Red Helmet, and *Chiloglottis diphylla*, Twin-leaf Bird Orchid, collected at Healesville.

By Mr. L. Thorn.—Forty species of insects taken on Easter excursion to Toolangi, also photographs of same locality.

After the usual conversazione the meeting terminated.

Nature Study Exhibition.—The second exhibition (in recent years) of specimens by members of the Field Naturalists' Club of Victoria was held in the Athenæum Hall on Tuesday, 20th June. A very fine display was made by members, but it has not been possible to prepare a detailed report in time for this *Naturalist*. It is hoped that this will be published next month. The exhibition was not quite so well attended by the general public as the previous one, but this had its advantages, for visitors could the more easily inspect the exhibits on this occasion. The exhibition was far from being a financial loss, and, besides the surplus which the Club will derive from it, the sales of flowers and plants brought in £7 7s., which has been handed over to the Children's Hospital.

The Eucalypts of Victoria.—In the recently-issued part (vol. xxxiv., new series, part 2) of the *Proceedings of the Royal Society of Victoria*, Mr. J. H. Maiden, I.S.O., F.R.S., F.L.S., Government Botanist of New South Wales, contributes a paper entitled "An Alphabetical List of Victorian Eucalypts." The author credits Victoria with having sixty-two indigenous species of eucalypts. He makes the statement that the tree originally described from Tasmanian specimens as *E. amygdalina*, Labill., has not been proved to occur in Victoria. This will be a surprise to most of our botanists. What we have regarded as *E. amygdalina* is really *E. radiata*, Sieber, or *E. numerosa*, Maiden.

The Late Mrs. John Simson.—It is with great regret that we announce the death, on the 30th ult. (her birthday), of Mrs. J. Simson, of "Trawalla," Toorak, at the ripe age of 92. Mrs. Simson was elected a member of the Club in July, 1884, and was therefore one of its oldest members. She always evinced great interest in the Club, and in 1885–6 had the distinction of being one of two lady members of the committee.

Termites and Ants.—Mr. James Hill, of Westell Farm, Kewell (Wimmera district), contributed a note on the action of some small black ants some time ago. On a close, muggy evening at the end of summer he had occasion to shift some sawn timber, which, on being moved, was found to be full of the so-called "white ants," termites. Knowing that the small black ants were deadly enemies of the termites, and that there was a track of them about five yards away, he went over, with the hope of being able to induce them to attack the termites. These, by the way, seemed to have a sort of sweet smell arising from them, while what air was moving was in the direction of the black ants from where the termites were. While standing thinking how a diversion in the proper direction could be induced, he saw the track of the black ants suddenly turn in the direction of the termites, and in a few seconds the ants were among the termites in thousands, soon putting an end to them by killing and cutting them up and carrying them off. The question to be answered is, Were the black ants attracted by the odour, or did some spy report the presence of the termites to the black ants?

Australian National Research Council.—At the meeting held in Melbourne last year of the Australasian Association for the Advancement of Science, steps were taken to form a council of representative scientists under the above name, for the purpose of promoting research in Australia, publishing the results of scientific investigations, &c. A very representative council was appointed, and recently additional members were added, among them being Mr. F. Chapman, A.L.S., ex-president of the Field Naturalists' Club. The council has now decided to publish quarterly abstracts of all scientific work being carried on in Australia, whether by Governments or private individuals. This will be a great boon to all workers, no matter in what branch they are interested. At present such persons have to wait, in most cases, until the annual volumes of societies' proceedings are published in order to learn what is going on in the next State. It is hoped to issue the first number of this review early in August, previous to the meeting of the Council, which is to take place in Sydney in that month.

Australian Rotifers.—Mr. J. Shephard, in an article in the *Proceedings of the Royal Society of Victoria* (vol. xxxiv., part 2), records 230 species as the census of Australian rotifers, but acknowledges that, as most of the investigations of this group of animal life have been done in the neighbourhood of the large cities, probably the number of species to be found in Australia is very much larger.

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The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

Published 10th August, 1922.

Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	41
Excursion to Toolangi	45
Nature Study Exhibition	47
The Introduction and Spread of Noxious Weeds. By H. W. Davey, F.E.S.	50
Notes	46, 54

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1922.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 14th AUGUST, 1922.

1. Correspondence and Reports.

2. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

3. General Business.

4. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

5. Reading of Papers and Discussion thereon.

   By Mr. J. W. Audas, F.L.S. "A Circuit of the Grampians."

6. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

7. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

OBJECTS.

THIS CLUB was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the exhibition of specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

NOTICE.

The new year commenced on 1st May. Subscriptions for 1922-3 should be paid as early as possible. Any unpaid subscriptions for 1921-2 should be forwarded to the Hon. Treasurer **at once.**

Any change of address should be notified to the Hon. Secretary at once.

The Victorian Naturalist.

Vol. XXXIX.—No. 4. AUGUST 10, 1922. No. 464.

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 10th July, 1922.

The president, Mr. C. Daley, B.A., F.L.S., occupied the chair, and about 50 members and visitors were present.

The president referred to the death since last meeting of Mrs. John Simson and Mr. William Stickland, both of whom had been members of the Club for long periods. The latter had contributed to the proceedings and acted as leader of excursions on several occasions. He also announced that Mr. A. J. Tadgell had suffered severe bereavement in the death of his brother.

A letter of condolence was ordered to be sent to the relatives of the deceased members and to Mr. Tadgell, members standing while the motion was put and carried.

REPORTS.

A report of the visit to the Technological Museum, Public Library, on Saturday afternoon, 24th June, was given by Mr. F. G. A. Barnard, who said that the party of about a dozen members had been met by the Curator, Mr. R. H. Walcott, who acted as guide for the afternoon and conducted them round the exhibits. The attention of the members was directed to the more notable objects, such as the specimens of Australian minerals, marbles, timbers, &c. The exhibit of grades of Australian wool, numbering nearly 900 examples, attracted some attention, as also the models of fruit suitable for export, &c. The collection of foodstuffs was found to be very complete, and manufacturing processes were well displayed. Altogether, the members spent a very interesting afternoon, and were well repaid for the time given to the visit.

ELECTION OF MEMBERS.

On a ballot being taken, Miss Munro, Anzac Hostel, North-road, Brighton, and Mr. G. C. Hodgson, P.O., Mentone South, were duly elected as ordinary members; Miss Mary M'Intyre, "Laggan," Merino, and Mr. A. J. Williamson, Bank of Victoria, Dunolly, as country members; and Mr. R. E. Gray, Dresden-street, Heidelberg, as an associate member.

GENERAL BUSINESS.

Mr. C. L. Barrett, C.M.Z.S., said that a deputation was to wait on the Minister of Lands on the following day in order to

oppose the alienation of any portion of Wyperfield Park, an area in the Mallee recently set aside as a national park.

Messrs. G. Coghill and E. E. Pescott, F.E.S., were appointed to attend on behalf of the Club and urge that no alterations be made in the boundaries of the park.

[In reply to the deputation, the Minister promised that no curtailment of the reserve would be made without consulting the bodies interested.—Ed. *Vict. Nat.*]

Mr. F. Pitcher announced that the Melbourne Town Hall had been secured for the annual exhibition of wild-flowers on Tuesday, 3rd October next.

PAPER READ.

By Mr. P. C. Morrison, entitled "A Simple Study of Our Common Serpula."

Owing to the absence of the author, on account of ill-health, the paper was read by Mr. F. G. A. Barnard.

The author stated the position of the genus Serpula in the usual arrangement of the animal kingdom, where it is placed in the Annelida, or tube-building worms. He then described the main features of the animal, which may be found in great numbers in various places around our bay, encrusting the rocks, piles, &c., below low-water mark with its calcareous vermiform tubes. He mentioned that Serpulids and their allies had been found as fossils in Victoria, notably *S. ouyenensis*, found in borings made at Ouyen, in the Mallee, at a depth of about 600 feet. Such fossil forms may be as old as 60,000,000 years. The author remarked that very little work had been done on our Victorian forms—in fact, they had not received specific names—and recommended the group as well worthy of attention by someone who was at a loss for an object for investigation.

A number of specimens and parts prepared for microscopic examination were exhibited in illustration of the paper.

NATURAL HISTORY NOTES.

Mr. A. J. Tadgell forwarded a note regarding the recent finding of the rare Greenhood Orchid, *Pterostylis Toveyana* near Mordialloc, in which he remarked how easy it is to pass it by for the Common or Trim Greenhood, *Pterostylis concinna*, as it is, vegetatively, like a robust, dwarf form of that species. He had found it in only two neighbourhoods, about three miles apart, in 1909 and in 1910, and it is so elusive that he had not seen it again until this year, though he had vainly sought for it. Dr. Rogers, of Adelaide, told him that "this orchid would appear to be in a transitional stage towards specific rank, but as yet without sufficient stability of characters." It is recognized as a hybrid from *P. præcox* (*reflexa*) and *P. concinna*.

In previous years it looked like *præcox*, with full stem leaves and practically no basal leaves. Again, he found it actually deceiving him for *concinna* in external appearance. It is recognized principally by the notched labellum, but that varies, so that in five plants found this year all together one had the tip of the labellum rectangularly notched evenly, as in *concinna*; another looked as if a neat, tiny spoon had taken out a round notch; while two others had scarcely any nick at all. These variations, it may be stated, were not due to the age of the flower. In answer to a point he raised with Dr. Rogers as to why it is so rare, seeing that we might expect to find hybridized forms of *concinna* (which is so common) with *præcox* (*reflexa*), which is not uncommon, as both are found flowering freely together, the doctor takes the view that at one time, when they first began to establish themselves, this form was fairly numerous, and thinks there can be no doubt that hybrids may become independent of their original parents and capable of propagation in the same way as species.

Mr. L. Thorne contributed a note on his entomological observations during the Easter excursion at Toolangi. He said that the trip to Toolangi was very interesting, and fairly successful from an entomological point of view, though, had it been a month or two earlier, it would almost certainly have been better. There is an abundance of undergrowth everywhere, and in and on this numerous species of butterflies and moths are certain to be found breeding; but larvæ-hunting is not very profitable work at this time of the year. The Sassafras tree is plentiful in all the gullies, and on this the larva of our beautiful Swallow-tailed Butterfly, *Papilio macleayanus*, feeds, and is sure to be fairly plentiful. One chrysalis of this fine Papilio was found attached to the under surface of a Sassafras leaf. The chrysalis was attached to the leaf by a small silken pad at the tip of its abdomen and a silken band around the middle. The caterpillar had passed a silken thread around another leaf, just above the one to which it had attached itself, and brought them together to form a roof-like structure. In this manner it spends the winter, not emerging till November or December. Other butterflies taken were the Barred Brown, *Heteronympha banksii*, the Ringed Xenica, *Xenica acantha*, Klug's Xenica, *Xenica klugi*, and *Orixenica kershawi*. Of the twenty-one species of moths taken, the one that caused most surprise, by the numbers taken, was *Porina australis*; of this, seventeen males and one female were successfully captured. Two other Hepialids taken were *Fraus palyspila* and *Oncoptera intricata*. Several species of Geometers were taken, including three Emeralds. A female of that interesting dipterous fly, *Boreoides subulatus*, was taken on a log at night

time by the aid of an electric torch. This "two-winged" fly has wingless females, though the male has wings as usual.

EXHIBITS.

By Mr. A. Allaway.—Atlas Moth, *Attacus atlas*, from Northern India.

By Mr. C. Oke.—A case of insects, principally Lepidoptera, from Belgrave, collected during Easter.

By Mr. F. Chapman, A.L.S., on behalf of National Museum. —Tube of Trachyderma, sp., from the Silurian in Punt-road, South Yarra, and gill-plumes of Trachyderma, sp., from the Silurian, Hawthorn Main Drain—both collected by Mr. F. P. Spry. These serve to illustrate Mr. Morrison's paper on Serpulids, being two very interesting fossil specimens of a tube-making worm, allied to the Sabellids—namely, Trachyderma, found rather abundantly in the bedrock of Melbourne. One of these consists of a tube, originally made of mud and organic slime, whilst in the piece of fine mudstone is shown to perfection the beautiful prostomial gills of the worm as they were laid out on the mud and now preserved in a carbonaceous film. This specimen is one of the few of which we know where the soft parts of the animal are so well preserved, and may date back about sixty millions of years.

By Mr. E. E. Pescott, F.L.S.—*Acrotriche fasciculiflora*, F. v. M., the "Bundled Ground-Berry," Mount Lofty, South Australia, showing the remarkable habit of bearing flowers in great bunches at ground level; found only in South Australia, and exhibited on behalf of Field Naturalists' Club of South Australia. Cultivated plant of *Dendrobium æmulum*, R. Br., native of New South Wales and Queensland. *Pisonia Brunoniana*, Endl., "Bird-catching Plant," native to New South Wales, Queensland, Norfolk Island, and New Zealand; grown at Melbourne Botanic Gardens; and *Eucalyptus torquata*, J. G. Luehmann, the "Coolgardie White Gum," showing decorative character of buds, grown at Melbourne Botanic Gardens.

By Master C. Ralph.—Egyptian Scarab, found in crypt of an Egyptian pyramid.

By Mr. A. E. Rodda, on behalf of Geological Survey of Victoria.—Talcose clay, from Gaffney's Creek; asterized or star quartz, from Coleraine; also photographs of birds—viz., White-shafted and Rufous Fantails, Mountain Thrush, Yellow-breasted Robin, and Lyre-bird, from Walhalla district.

By Mr. A. L. Scott.—Pebbles from beach of Lake Rotorua, N.Z.; sulphur-coated grit from hot spring on beach, Lake Rotorua.

By Mr. L. Thorn.—Seventy-two species of Victorian butterflies, with 19 kinds of empty chrysalid cases, from which perfect insects had emerged.

By Mr. H. B. Williamson, F.L.S.—Flowering specimens of Gippsland Heath Myrtle, *Thryptomene miqueliana*, F. v. M., and Pine Heath, *Astroloma pinifolia*, Benth., collected at Bairnsdale by Mr. T. S. Hart, M.A.

After the usual conversazione the meeting terminated.

EXCURSION TO TOOLANGI.

THE visit to the Toolangi district at Easter, 1922, was the third which the Club has made to that locality. Toolangi (about 45 miles from town) is situated at the foot of Mount St. Leonard, on the crest of the Dividing Range, about 14 miles north of Healesville. As a place for those who want to roam among big timber or struggle through dense undergrowth it cannot be excelled. Our party was small, but none the less enthusiastic in its desire to explore the land. We left town by the evening train on Thursday, 13th April, and in due course reached our quarters at "Laurel Grove" late the same evening. This we found to be on the northern side of the Divide, and not far from the ever-running Yea River. Here we were well cared for and cheerfully welcomed on our return from the various walks taken. Good Friday was devoted to a walk to the well-known Sylvia Falls, which we found somewhat difficult, as the tracks have been allowed to become almost impassable on account of fallen timber. The winter snows have also brought down the saplings and other shrubbery, so that progress was slow. However, we were compensated for our difficulties by the magnificent vegetation on every side. The next day we secured the services of a resident as guide, and made the longer trip to Myrtle Gully—a trip of surpassing loveliness so far as the vegetation is concerned. Huge eucalypts, myrtle-beeches, sassafras, &c., with tree-ferns *ad libitum*, made a picture not easily forgotten, while trampled under foot were scores of smaller ferns of many species. Coral Ferns and Star Ferns wreathed the bushes on either side of the track. Though the distance was not great, the difficulties of the way were such, and there was so much to admire, that darkness had closed in before we got back to "Laurel Grove." Sunday morning was spent quietly; in the afternoon we visited Blue Mountain, situated off the Myers' Creek (Healesville) road. This commands fine views of the Healesville and Warburton country, and on clear days Melbourne is within the range of vision. Easter is perhaps the worst time of year for wild-flowers in Victoria, so that it was with feelings of regret we noted that hereabouts seemed to be the best locality for wild-flowers that we had seen. A scrap of Tetratheca and

a flower of Correa (red variety) was all we could find. Monday was rather close and hot, and little was done. However, the pretty little Lawrence Falls were visited. These we found set in a framework of ferns, which made them particularly attractive. Our final day (Tuesday) was showery, and "the round trip," as it is known, had to be abandoned. Mr. A. E. Keep, who stayed a few days longer, and was joined by Mr. and Mrs. Pitcher, informs me that they accomplished "the round trip" on the next day, and had a most interesting outing. Birds were much more numerous than on other days. Near one of the mills they saw a flock of Crimson Lories, *Platycercus elegans*, numbering at least one hundred, making such a feast of colour in the bright sunlight as they had never seen before. The "round trip" encircles a hill locally known as "Mount Tanglefoot," which is so called from the quantity of *Prostanthera melissifolia* growing on its slopes, forming an almost impenetrable tangle. This, when in flower, is said to be a most delightful sight, the quantities of pale lilac flowers making a scene worth going miles to see. Our entomologist was well satisfied with his captures, and proposes to furnish his own account of the outing.—G. Nokes.

[Previous trips to Toolangi will be found recorded in the *Naturalist* for February, 1910 (xxvi., p. 144), and March, 1918 (xxxiv., p. 173). Mr. Thorne's notes *re* the entomology of the trip appear on page 43 of this issue.—Ed. *Vict. Nat.*]

The Late Mr. William Stickland.—It is with great regret that we record the death, at the age of 72, of Mr. Wm. Stickland on the 5th ult. He was one of the early members of the Club, having been elected in July, 1885. His hobby was pond-life, and his only paper read before the Club (in September, 1894) was on that subject. It was entitled "The Rotifer in Melbourne," and described the results of a dip in the pond in the Treasury Gardens, now known as the Japanese Lake, during luncheon hour. His captures on that occasion were described in an entertaining manner in the *Naturalist* for October, 1894 (vol. xi., p. 100). He, with his brother, Mr. Jno. Stickland, led many excursions to various places for a like purpose. He was by profession a wood-engraver, and the *Naturalist* contains two or three specimens of his work in the earlier volumes, before process engraving was adopted for illustrations. For some years he acted as assistant librarian and secretary to the Royal Society, for which his knowledge of scientific books and other publications made him well suited.

Correction.—In July *Naturalist* the words in line 25, page 38, should follow "N.S.W." in line 28.

NATURE STUDY EXHIBITION.

THE exhibition of specimens by members of the Club in June, 1921, having proved so attractive, it was decided to hold a similar exhibition this year, and the Athenæum, Collins-street, was engaged for the afternoon and evening of Tuesday, 20th June, for the purpose. On this occasion the Microscopical Society did not share in the venture, but several members of the Club undertook the exhibition of specimens under microscopes.

The president of the Club, Mr. Chas. Daley, F.L.S., in asking Sir Baldwin Spencer, K.C.M.G., to declare the exhibition open, said that Sir Baldwin was not unacquainted with the history of the Club and its work, for he was a past president of the Club, and had taken part in three or four of its notable expeditions.

Sir Baldwin Spencer, in declaring the exhibition open, thanked the Club for giving him the opportunity of assisting in one of its functions again, and said how much he was indebted to the Club and its members for helpful information when he arrived as a novice from England some thirty-five years before. He referred to the attitude the Club had taken up in securing the protection of both animal and vegetable life, for which it was to be commended. At the same time, he often wondered whether the right birds or animals were being protected, and instanced the Laughing Jackass. This bird he had watched a good deal, and considered it an absolute "smoodger." So far as its habits were concerned, it was not worth protecting, but it had got into their good graces by now and again killing a snake, and so being considered useful; but how many young birds and eggs did it take from other birds' nests? Again, he had never hesitated to capture an insect and put it in a killing bottle; yet he did not know whether some of these were not useful, and should be protected. He pointed out how investigation was still required with regard to our rapidly-disappearing fauna and flora, and urged workers to take up certain lines of study and endeavour to learn all they could regarding the various forms before it was too late.

The attendance of the public was not quite so large as had been expected, but it had its compensations, for the exhibits could be examined in greater comfort than had the hall been crowded, as on the previous occasion.

The range of exhibits was very wide, and details given must not be considered by any means complete, as many of the exhibitors failed to hand in particulars of their specimens.

BOTANY.—Midwinter is not the best time for a display of wild-flowers; yet, owing to the organization of Mr. H. B. Williamson, F.L.S., they made quite a feature in the hall.

About seventy-five species (not including orchids) were on exhibition, about three-fourths of which were forwarded from Bairnsdale and Bendigo by Messrs. T. S. Hart, M.A., and D. J. Paton. The former collection included *Rubus rosifolius*, *R. parvifolius*, *Isopogon anemonifolius*, *Bossiæa heterophylla*, *Correa alba*, *C. speciosa* (red variety), the Sunshine Wattle, *A. discolor*, and early flowers of the Sweet Bursaria, *B. spinosa*. Among Mr. Paton's flowers were the Blue Mallee, *Eucalyptus fruticetorum*, Green Mallee, *E. viridis*, Shrub Violet, *Hybanthus floribundus*, Fairy Waxflower, *Boronia polygalifolia*, and six species of Acacias—viz., *lanigera*, *lineata*, *armata*, *diffusa*, *pycnantha*, and *vomeriformis*. From Miss Mackenzie, of Boronia, came about a dozen species, among which were *Acacia myrtifolia* and *Epacris microphylla*. Miss Dyall, of Garfield, forwarded some fine dark crimson Epacris, as also did Mr. Fairnie, of Moyston, from Mount William (Grampians). The acting director of the Botanic Gardens furnished some fine pot plants, &c., for platform decoration. A large quantity of "Crimson Berry," *Cyathodes acerosa* (*Styphelia oxycedrus*) (Epacridæ), had been promised by the Tasmanian Tourist Department, but, unfortunately, owing to a strike, the steamer's sailing was delayed, and only some brought over by an earlier steamer was available. This was very much admired, and sold readily. Mr. Ising, of the South Australian Field Naturalists' Society, and Mrs. Page, of Myponga, S.A., also forwarded flowers, but unfortunately they were delayed on the railways, and did not reach Melbourne till next day. A tastefully-arranged display of orchids was made by Mrs. Coleman, who exhibited about twenty species, including the rare Banded Greenhood, *Pterostylis vittata*, which had been collected at Point Lonsdale by Mr. G. Ampt, sen. A collection of mounted specimens of common weeds was exhibited by Mr. A. J. Tadgell, while Mr. T. Green exhibited a number of splendid photographs of orchids and other flowers as stereoscopic objects, and a large case of seed-vessels of Western Australian shrubs and leaves was shown by Miss Amy Fuller.

Conchology.—Mr. C. J. Gabriel had an extensive display of shells, both Australian and foreign, also several educative exhibits, such as the common shells of our sea beaches, the largest and smallest Victorian shells, the way in which the animal repairs its home, &c.

Entomology.—Mr. H. Clinton, bird parasites (Mallophaga), under microscopes; Mr. J. E. Dixon, four cases of buprestid or jewel beetles; Mr. C. French, jun., four cases of injurious insects; Mr. C. Oke, case each of scarabid and buprestid beetles, also aberrant wingless fly, parasitic on bat (under microscope); Mr. F. P. Spry, three cases of ants; Mr. L. Thorn, two cases of moths and butterflies and case of cicadas; Mr.

F. E. Wilson, cases of longicorn and ladybird beetles, also small pselaphid beetles (under microscope); National Museum, two cases of wasps and nests and two cases of foreign beetles.

Ethnology.—Mr. C. Daley, F.L.S., aboriginal stone implements; Mr. E. E. Pescott, F.L.S., case of stone implements and spear-heads.

Geology and Palæontology.—Mr. F. Chapman, A.L.S., Cambrian fossils, showing anatomical structure, from British Columbia; fossil and recent Foraminifera from the Antarctic. Mr. S. R. Mitchell, minerals and crystals; Mr. A. E. Rodda, banded Silurian rocks, from Heathcote; Mr. F. A. Singleton, M.Sc., evidence of radio-activity in rocks, and quartz crystals with included bubbles. Miss I. Crespin, B.A., moulds and casts of fossils in ironstone and chert, with method of reproducing originals in wax; fossiliferous limestones with foraminifera, &c. Miss K. M. M'Inerny, M.Sc., minerals under microscope with polarized light. Mr. F. Cudmore, 13 cases of fossil shells from Mornington-Frankston district; three of fossil shells from rocks at Torquay; case of Victorian Trigoniæ (five fossil species, one living); four cases of fern impressions in Palæozoic rocks; two cases of teeth (mostly sharks) from Beaumaris, &c.; three cases illustrating formation of casts, moulds, and petrifactions; also petrified wood, fossil bone, oysters, &c. Mr. C. Daley, F.L.S., minerals associated with gold, also photographs of Victorian and Tasmanian scenery, lent by respective Tourist Bureaux.

Ornithology.—Director of National Museum, mounted specimens of some of the larger Victorian birds.

Pond and Shore Life.—Mr. J. Searle and Miss J. Raff, M.Sc., and friends had interesting displays under microscopes.

Zoology.—Director of National Museum, mounted specimens of kangaroos, platypus, &c.

Microscopy.—Mr. A. D. Hardy, F.R.M.S., botanical sections, including autoparasitism of *Cassytha melantha*; intercalation of cork layer between stem and leaf-stock of a deciduous plant preceding fall of leaf; defensive armory of stellate and branched cellulose hairs on cells of floating water-lily leaf, presumably a protection against water-snails, &c.; pollen grains of eucalypts and other Myrtaceæ, Epacris, Acacias, &c.; cuticle specimens showing stomata in various arrangements, usually on under sides of leaves, but on both sides in eucalyptus, and in grooves in leafless stem and branches of Casuarina.

The sale of pot plants (native shrubs) and flowers, under the direction of Miss A. Fuller, realized £7 7s., which was forwarded to the Children's Hospital.

The final result of the exhibition, to which a charge was made, is not complete, but there will be a credit balance of several pounds.

THE INTRODUCTION AND SPREAD OF NOXIOUS WEEDS.

By H. W. DAVEY, F.E.S.

(*Read before the Field Naturalists' Club of Victoria, 8th May, 1922.*)

THE various means by which the seeds of plants are dispersed are of interest, not only to the lover of nature, but also to the agriculturist. The latter has always to be fighting against the encroachments of plants that would, if they were left alone, rob the soil of its moisture and fertility, as well as crowding out or smothering his crops.

The dispersal of species, whether animal or vegetable, is always an interesting subject. The large animals can roam over large tracts of country. Birds fly and fishes swim to other localities or countries. With the lower animals these often avail themselves of other means of transit. Young ticks, for example, will, when newly-hatched, climb up grass stems, where they will sit with the first pair of legs outstretched, patiently waiting for some animal to brush past them, to which they will immediately cling. In this they not only succeed in securing a host, but get transported to fresh localities.

It has often been stated that "commerce follows the flag," and it could with equal truth be said that "pests follow commerce." This is especially true with regard to some of our worst pests, both insects and plants. The seeds of many bad weeds enter a country through the medium of impure commercial seeds; these impurities are probably the most fertile source by which many noxious plants gain entry into a country. As showing the necessity for a pure seed supply, it has been estimated that if only one seed of dodder is planted with every thousand seeds of clover the entire crop of the latter is likely to be ruined.

Apart from the entry of weed pests by means of impure seed, many seeds of bad plants enter a country with material used in the packing of fragile goods. Ships arriving from foreign countries in sand ballast—the latter being afterwards used for reclamation purposes—is also a common source for the invasion of many undesirable alien plants. The importation of hay during periods of drought, or its exportation during war for the needs of cavalry, has enabled many bad weeds to firmly establish themselves in remote areas.

Once introduced, the means by which they spread are many, chief of which probably are as follow:—Wind, farm produce, stock, railways, water, birds, rabbits, manure, and wool-washing.

There is one important fact that must not be overlooked—this is, that an animal or plant is usually more troublesome

in its adopted country than in that of which it is a native. A plant that gains entry into a new land usually arrives as a seed, and is therefore mostly free of the controls that formerly kept it more or less in check in its native country. A good example of this is afforded by the success attending the growth of our wattles in South Africa, where they are now largely grown for the sake of their bark for tanning purposes. The seeds of these trees, when introduced into South Africa, entered there free of Australian controls, so that at the present time these trees are practically immune from attack by African insects or fungi, as these as yet have not acquired a liking for these trees. Here, as is well known, wattles are often badly attacked by wood-boring and defoliating insects, and, in addition, are sometimes killed outright by a species of Uromycladium fungus. This present immunity of the wattles growing in Africa is due to the fact that they entered that country as seeds, leaving their natural controls behind them in Australia. This applies to practically all introductions, and it is for this reason that the greatest care should be exercised in introducing new species, and especially those having potentialities for becoming pests.

We have in Australia many instances where introductions have been made of mammals, birds, fishes, and plants, without due consideration having been given to this most important matter. A few notable examples of bad introductions are those of the fox, rabbit, starling, and the English perch, while among plants we have the Blackberry, Stinkwort, and St. John's Wort. After the introduction of pest animals or plants there are many people who are of the opinion that the "balance of nature" can again be easily established by the introduction of some controlling agent or agents. An example of this belief was the recent proposal to introduce a chrysomelid beetle, *Chrysomela hyperici*, from Europe for the purpose of controlling St. John's Wort in Australia. Fortunately, this most unwise step was not persisted in, and Australia has so far escaped this danger. People who talk loosely about the introduction of controls do not always stop to consider that an insect introduced for control purposes against a noxious plant must itself be introduced free from controls if it is to be effective against the plant which it is expected to hold in check. Many insects have a wide range of host plants; others, again, acquire tastes for plants that are quite new to them, and which often differ widely from their native food plant. It is here where the danger lies, for if an introduced chrysomelid beetle, free of controls, should change its diet from that of St. John's Wort to some other plant or plants, the results might easily be far more calamitous than even the St. John's Wort itself is at present. And so it might go on, seeking for controls

to control controls. Nature does not exterminate species, and therefore the very most that could be hoped for would possibly be a lessened seed production on the part of St. John's Wort.

The most important thing in weed-control is first to prevent weed seeds entering a country, and secondly, to prevent seed-production by those weeds already in the country. Once pest plants are introduced they spread themselves over the country by several means. As is well known, the seeds of many plants are furnished with a special adaptation that enables them to be carried long distances through the air by the wind. Familiar examples of wind-borne seeds are Dandelion, *Taraxacum officinale*, Prickly Lettuce, *Lactuca scariola*, Thistles (Carduus), and Stinkwort, *Inula graveolens*. Owing to the sticky nature of the latter plant it not only arrests an enormous number of its own seeds, but also that of many other species, and especially those of thistles. Other seeds often distributed by wind are those of a dust-like nature, such as those of Poppies (Papaver). These, on account of their small size, are caught up by the wind and scattered over wide areas.

SEEDS CARRIED BY FARM PRODUCE.

Hay and chaff are the media by which many bad weeds are disseminated, and the spread of St. John's Wort has been in very many instances due to the seeds of this plant having been included in hay or chaff that was fed to horses. This can readily be seen by the way in which St. John's Wort has followed railway construction. In fact, any place that has been used for any length of time as a camping-ground for horses in the North-East of Victoria, there this plant can usually be found growing. In some notable instances these camping-grounds have been the starting-places for the further spread of this weed over very large tracts of country.

SEEDS CARRIED BY WATER.

Flood waters distribute seeds of plants over wide areas, and are one of Nature's methods for the dispersal of species, both animal and vegetable. The seeds of many bad weeds are spread in this manner, as also by rivers and streams. Probably irrigation channels are the worst of all offenders with water-borne seeds. These channels run through many miles of country, carrying seeds of many species of weeds on the surface of the water, some of which find lodgment on the banks, where they usually find congenial conditions for their growth. These plants later on shed seeds into the water, so that when water is taken from these channels for irrigation purposes these seeds are distributed over the irrigable lands, and are a menace to all land-owners in the areas served by these channels. Seed-

dispersion by irrigating water would be considerably reduced if the weeds were destroyed on the banks of these channels or not allowed to produce seeds, as usually they now are unchecked.

SEEDS CARRIED BY STOCK.

Stock are famous weed-carriers. Many seed-vessels are specially provided with hooked processes that enable them to cling tightly to the coats of animals. The Bathurst Burr, *Xanthium spinosum*, is a common example of this class of seed. These may be carried long distances before the seeds are shed from their hooked receptacles.

Stock spread the seeds of many plants by feeding on weeds that are carrying ripe seeds, which pass through the digestive tract and remain viable. Dodder (Cuscuta), is often spread to clean areas in this manner. Many bad weeds, carrying ripe seeds, become entangled in the fleeces of travelling sheep. These seeds often are not shed until very long afterwards. The great spread of St. John's Wort is undoubtedly largely due to stock movements, and it is probably owing to the facility with which this seed is carried by travelling sheep that this plant has become so widely spread, both here and in New South Wales. Rabbits also spread this and other small seeds by dashing through masses of weeds, so causing the ripe seeds to shower down on their fur, the seeds later on to fall or be scratched out, this often at long distances away from where the plants were growing.

The seeds of Boxthorn, *Lycium horridum*, and Blackberry, *Rubus fruticosus*, are being widely spread by birds, the imported Starling being a great offender in this respect, thus adding to its already long list of offences.

STABLE MANURE.

Stable manure, unless composted and well rotted before being applied to the land, is often the means of establishing many undesirable plants.

FARM MACHINERY.

Threshing machines carry weed seeds from one farm to another to such an extent that it should be made compulsory for the owners of these machines to clean them after threshing, and this before the machine was taken off the farm where it had been employed.

Farm implements, such as ploughs, harrows, and cultivators, often greatly assist in the spread of those plants that have running roots or rhizomes. Take, for example, the Perennial Thistle, *Carduus arvensis*. This plant is easily spread if the cultural methods carried out for its suppression are not carefully done. Ploughing operations break up the underground

rhizomes of this plant into small pieces, most of which are capable of forming themselves into new plants. The harrows or cultivators still further spread these small sections of roots, so that from a small patch of this thistle whole paddocks may become smothered by this most troublesome weed.

The same trouble occurs with Bindweed, *Convolvulus arvensis*, which is often such a source of trouble to many orchardists. The same can also be said of Hoary Cress, *Lepidium draba*, that pest of the Wimmera farmer.

ROOT-STOCKS.

Underground stems, commonly known as root-stocks or rhizomes, enable a plant to travel long distances beneath the surface of the ground. Johnson Grass, *Sorghum halepense*, sends out roots many feet in length that enable it to rapidly spread itself away from the parent plant.

THROWING SEEDS.

Many plants, such as the common Tare, *Vicia sativa*, and Furze, *Ulex europæus*, throw their seeds for considerable distances. The pods of these plants dry in such a way as to produce a strong tension, which causes them to split apart violently, scattering the seeds in all directions, especially during the heat of the day.

SEEDS DISTRIBUTED BY ANIMALS.

Large seeds, such as nuts and acorns, are carried away from where they have fallen by rodents (chiefly squirrels, rats, and mice) for food purposes, some of which may become overlooked. This often enables these trees to become widely spread. Animals, and especially squirrels, are of benefit to the trees by carrying the nuts and acorns often to long distances, where usually a number of the seeds are buried by them for later requirements. Possibly this seed-burying habit is payment in return for nuts consumed by these animals.

Some species of ants collect seeds over wide areas and convey them to their nests. This trait must also assist in seed-dispersal.

"THE AUSTRAL AVIAN RECORD."—The March issue of this journal (vol. iv., No. 7) is to hand. As usual, there are a number of additions and corrections to be made to Mr. Gregory Mathews's Check-list of 1920. A notable alteration is the name of the Naretha Parrot, *Psephotus narethæ*, H. L. White, figured in *The Emu* of October last from specimens obtained near Naretha (East–West Railway), Western Australia. This becomes *Northiella hæmatogaster narethæ*. Notes on some forgotten bird books make up the remainder of the part.

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The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

Published 7th September, 1922.

Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	55
Excursion to Mt. Evelyn	58
The Late Mr. Frank P. Spry	60
Aboriginal Implements. By Dr. Geo. Horne, V.D. ..	63
Notes	57, 65, 66

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1922.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 11th SEPTEMBER, 1922.

1. Correspondence and Reports.
2. Election of Members.

	Proposer.	Seconder.
As Ordinary Members—		
Mrs. E. Coleman, "Walsham," Blackburn Road, Blackburn.	Mr. A. J. Tadgell.	Mr. H. B. Williamson, F.L.S.
Miss E Hewitt, "Strathroy," Barker's Road, Hawthorn.	Miss G. Nethercote.	Mr. C. A. Nethercote
Mr. A. Brown, B.A., LL.B., 27 Wattletree Road, Malvern.	Mr. R. Hammet.	Mr. T. R. H. St. John
Mr. C. Wilkinson, Grove Road, Hawthorn.	Miss F. Power.	Mr. T. R. H. St. John.
As Associate Member—		
Master H. Wentworth, Wellington Street, Kew.	Mr. F. Chapman, A.L.S.	Mr. F. G. A. Barnard.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.
5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

   By Mrs E. Coleman—"Some Autumn Orchids."
   By Mr. C. Oke—"An Entomologist in the Dandenongs."

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

EXHIBITION OF WILD-FLOWERS.

The Annual Exhibition of Wild-Flowers will be held in the Town Hall, Melbourne, on Tuesday, 3rd October. Members are urged to ask their country friends to send good supplies of flowers, which must be despatched from country stations not later than last train on Monday evening, 2nd October. Copies of a circular containing instructions can be obtained from Mr. H. B. Williamson, F.L.S. (Assistant Secretary), Waverley-road, Caulfield East. Tickets of admission will be available at monthly meeting. Half the net proceeds will be handed over to the Children's Hospital.

The Victorian Naturalist.

Vol. XXXIX.—No. 5. SEPTEMBER 7, 1922. No. 465.

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 8th August, 1922.

The president, Mr. C. Daley, B.A., F.L.S., occupied the chair, and about sixty members and visitors were present.

The president said that since the last meeting one of the oldest members of the Club, Mr. F. P. Spry, had passed away after a short but severe illness. Mr. Spry was a member the Club could ill afford to lose, for, though he had not contributed any paper to the meetings, he was a keen observer both in entomology and geology, and was always willing to give any information in his power to inquiring naturalists regarding any specimens submitted to him. He moved that a letter of sympathy be forwarded to his widow and family. The motion was seconded by Mr. J. A. Kershaw, F.E.S., and supported by Messrs. F. G. A. Barnard and D. Best, and carried in silence, all standing.

CORRESPONDENCE.

From the Secretary of the Australasian Association for the Advancement of Science, Sydney, stating that the next session of the Association would be held at Wellington, N.Z., in January, 1923, and asking the Club to appoint delegates on the general council. The appointment of delegates was referred to the committee.

REPORTS.

Mr. C. Daley, F.L.S., reported that the visit to the Biology School, University, on Saturday afternoon, 15th July, had been well attended, over thirty members availing themselves of the opportunity of seeing the zoological department of the school. Professor Agar, M.A., gave a short lecture on Mendel's law of heredity, using specimens and diagrams to illustrate his remarks, which were confined principally to the results of cross-breeding in rabbits. Many interesting exhibits had been laid out on the benches for inspection, while the assistant demonstrator, Miss J. Raff, M.Sc., had given an interesting exhibition of section-cutting, staining, and mounting preparations for microscopic examination. Through a camera lucida members had been invited to try sketching the mouth-parts of a fly. Altogether, a most interesting and instructive afternoon had been spent.

A report of the excursion to Sherbrooke, Dandenong Ranges, on Saturday, 5th August, was given by the leader, Mr. C. Oke,

who said that, owing to the short notice, the party was rather small. The excursion had been arranged in order that the Lyre-birds might be seen in the nesting season, but owing to the dampness of the gullies it was found impossible to remain perfectly quiet amongst the scrub, consequently little was seen of the birds.

GENERAL BUSINESS.

Mr. H. B. Williamson, F.L.S., said that he had heard that it is proposed to introduce stoats and weasels into the State for the purpose of destroying rabbits. This, he thought, would be a serious mistake, and said that if this was likely to be done a protest should be entered by the Club.

Mr. J. A. Kershaw said that it was not likely that any such action would be allowed.

Mr. F. Pitcher said that the committee had suggested that one-half of the net proceeds of the forthcoming exhibition of wild-flowers be handed over to the Children's Hospital. He moved accordingly, and, being seconded by Mr. H. B. Williamson, it was carried unanimously.

PAPER READ.

By Mr. J. W. Audas, F.L.S., entitled "A Circuit of the Grampians."

The author described the notable plants met with during a drive of about 180 miles made in December last in company with Mr. C. W. D'Alton. During the drive the group of ranges known as the Grampians was completely encircled as close to the foot-hills as possible. Several new records of plants for the south-western division were made, and a most enjoyable trip resulted.

REMARKS ON EXHIBITS.

Mr. P. C. Morrison called attention to a series of exhibits in illustration of his paper read at the previous meeting, when he was, unfortunately, absent. These included living Serpula; Nereis, with jaws and pharynx extended and retracted; Aphrodite, "Sea-mouse," resembling a mammal rather than a worm; Polynoë, a polychæte worm, protected with dorsal plates like an armadillo; Sabellid, a tube-building worm with very prominent plumose gills; Serpula tubes, round and ridged forms; examples of commensalism, or "table-sharing"—(*a*) periwinkle completely encrusted by Serpula, (*b*) Spirorbis (fam. Serpulidæ) on eye-stalk of crayfish. Some of these were exhibited through the kindness of Professor Agar, of the zoological department, University.

Mr. A. L. Scott drew attention to some geological specimens,

being ejecta from Fryingpan Flat, in the neighbourhood of the eruptive area of Rotorua and Tarawera, New Zealand. These were mostly mud, dried and hardened, though in some there are fragments of rock somewhat decomposed. The locality gets its name from the fact that it is always sizzling. The flat covers an area of about 40 acres in the bottom of a rift which opened in 1886, at the time of the Tarawera eruption. It had for its neighbour the famous Waimangu geyser, which was born in 1900 and was apparently extinct in 1904. On 1st April, 1917, early in the morning, Fryingpan Flat blew up with a great noise, and remained in eruption for some hours. The ridge forming the lip of the rift at that point is covered with what looks like light-coloured shingle, together with occasional pieces of rock. The shingle proves to be hardened mud, and the guide stated that the ejecta completely covered the neighbourhood from which the specimens were collected.

EXHIBITS.

By Mr. J. E. Dixon.—Unique aboriginal flint knife from Portland, Victoria ; aboriginal bone needles from kitchen midden at Altona Bay, Vic.; and stone tomahawk found in the Alexandra-avenue extension, South Yarra.

By Mr. P. C. Morrison.—Serpula and specimens in illustration of paper.

By Mr. C. Oke.—A small wingless fly (Diptera), under microscope.

By Geological Survey of Victoria (per Mr. A. E. Rodda).—Four specimens of serpentine from Mount Wellington, Gippsland, and Waratah Bay.

By Mr. A. E. Rodda.—Six photographs of nests and eggs of following birds, taken in Walhalla district, viz. :—Blue Wren, Coachwhip-bird, Mountain Thrush, White-eye, Rufous Whistler, and Striated Tit-Warbler.

By Mr. A. L. Scott.—Ejecta from near Rotorua, N.Z., mostly dried mud, in illustration of note.

By Mr. L. Thorn.—Larvæ, pupæ, and imagines of the large Victoria Moth, *Chelepteryx collesi.*

After the usual conversazione the meeting terminated.

We desire to congratulate our fellow-member, Mr. A. E. Kitson, O.B.E., F.G.S., on the recent honour of C.M.G. bestowed upon him by the King, in recognition of his services to the Empire as Director of the Geological Survey of Nigeria, West Africa. Mr. Kitson served for many years on the Geological Survey of Victoria before taking up work in Africa.

EXCURSION TO MOUNT EVELYN.

DESPITE the rain that had fallen overnight, and the dull, cloudy morning, a party of over thirty members and friends assembled at Mount Evelyn on Monday, 5th June (King's Birthday), for this excursion. Unfortunately, through illness, my co-leader, Mr. C. L. Barrett, C.M.Z.S., was unable to attend, and, as a consequence, very little observation of the bird-life was done. We decided to take the track along the old Lilydale water-race to the Cascades, on the Olinda Creek. We were told it was only two miles to the Cascades, but everyone in the party agreed that the distance was greatly underestimated. The track is very narrow, and is being gradually overgrown by the vegetation on either side; and, as everything was very wet, those in front soon had wet legs. While those in the rear did not have this trouble to contend with, they found the track much more slippery, in consequence of the many feet passing along it. The crimson form of the Native Heath, *Epacris impressa*, was out to perfection most of the way along this track, but, on account of the moisture—in fact, it amounted to water—clinging to the vegetation, very little was picked. Also, due to the same cause, very little collecting or observation could be carried out. However, on turning over a log I was rewarded with a specimen of one of our weevil-like longicorns, *Athemistes æthiopsis*, Pasc., and several Adeliums. Hanging to the bushes were numerous "houses" of our common leaf-rolling spider, *Arachnura wagneri*, but I did not notice one with its web spread; they were simply suspended by their guy ropes. On the side of the race, near a culvert, in a dark spot, several beautiful webs of an Argiopid spider, *Araneus bradleyi*, were seen and admired, looking very beautiful with their iridescent beads of moisture shining in the pale sunlight. Flowers, other than the red heath, were very scarce, though a few spikes of the white heath were occasionally seen. The common green "Native Fuchsia," *Correa speciosa*, was occasionally seen, and at least one nice piece of the Star-shaped Fuchsia was obtained. *Grevillea alpina* was just showing a few flowers. There were several rather awkward places to negotiate, and in crossing one steep-banked creek some amusement was caused by the slipperiness of the mud on the banks. At last we reached the Cascades, and decided to have lunch. While we waited for the "billy" to boil the more energetic members of the party decided to hunt around for interesting specimens. Here, as along some parts of the track already traversed, numerous species of fungi were to be found. Some of these were bright red, others were of a beautiful shade of blue; but yellows and browns predominated. In some Mela-

leuca growing over the creek several nesting-places of the Ring-tailed Possum were observed. They were all old nests, it being too early for this season's nests. In an ants' nest three specimens of Eupines (sp. ?) were secured, and under a stick a male of *Tyromorphos speciosus*, King, was taken. This is the largest Pselaphid beetle found near Melbourne; it is 8 mm. long. Under a piece of rotting bark, on the ground, I took what is almost certainly a new species of Staphylinidæ, and about the smallest recorded from Australia; it is under the half millimetre, or approximately one-sixtieth of an inch. Hours might have been profitably spent here by any entomologist, but the party seemed to think we had had enough, so, as soon as lunch was over, we started off again, going further up the creek, then on to a track that led to the Wandin road, and then followed that road back to the station. On the way out the leader was kindly allowed to lead—that is to say, he was always somewhere near the front; but, once we got near the road, the majority apparently decided the leader was an unnecessary appendage, and dispensed with his services entirely, and rushed off along the road to the station, arriving there about three hours and a half before the train was due to leave. They then decided to walk on to Lilydale, and thus passed out of my ken. While this party was thus rushing off to Lilydale, the leader was bringing up the rear with a party that had dwindled down to four, who made a determined effort to bring home something worth while to show for the day's outing. Cutting tussocks of grass and sifting over paper proved very instructive and entertaining. Numbers of small spiders, representing many families, were obtained, also some large Wolf Spiders, Lycosidæ. Most people seem terrified at spiders—I know not why; and the way one lady member of the party put her hand on the ground in front of these large wolf spiders, and allowed them to run over her hand, would have given most people the "creeps" for days after. After searching diligently through this grass, several beetles were obtained, the best being an undescribed species of Narcodes. Under a stick a fairly rare Staphylinid, *Œdichirus geniculatus*, Lea, was obtained, while we obtained a specimen of *Chlamydopsis setipennis*, Oke (MS.), in an ants' nest. Two surprises in flowers were a small spray of *Tetratheca ciliata* and two small bushes of *Leptospermum scoparium*, out in flower. Were they late or early? Mr. A. D. Hardy had kindly invited members to his country residence, adjacent to the station, to have tea, and a few availed themselves of his offer, returning to town by the last train, well satisfied with the pleasant day spent.—Chas. Oke.

THE LATE MR. FRANK P. SPRY.

VICTORIAN entomologists will deeply regret the death at South Melbourne, on 8th August, of Mr. Frank Palmer Spry, entomologist at the National Museum, Melbourne. He was one of the early members of the Field Naturalists' Club of Victoria, having been elected in February, 1882. He was a regular attendant at the meetings of the Club, where he will be greatly missed, and generally had some interesting exhibit, but un-

THE LATE MR. F. P. SPRY.

fortunately could never be induced to commit any of his extensive knowledge to paper.

Mr. J. A. Kershaw, F.E.S., zoologist, National Museum, Melbourne, pays the following tribute to Mr. Spry for his entomological work:—

"Mr. Spry was one of the most enthusiastic of our entomological members, and retained a very keen interest in his favourite subject up to the time of his death. Born at St. Kilda on 18th June, 1858, he developed at an early age an interest in entomology, devoting his attention to Victorian butterflies. Prior to the formation of the Club he was in close association with the late W. and D. Kershaw, of the National Museum, and Messrs. D. Best, C. French, sen., and others who later took a prominent part in the formation of the Club, and with them collected in Studley Park, Brighton Beach, and other localities, at that time favourite collecting-grounds.

"In 1893, in conjunction with Mr. Ernest Anderson, he published the 'Victorian Butterflies,' a most useful publication, which has long since run out of print.

"In 1904 he joined the staff of the National Museum as museum assistant, and in 1920, in view of his excellent work in connection with entomology, was promoted to the position of entomologist. It was in entomology that he did his best work, and throughout his eighteen years' association with the Museum took the keenest pride in the preservation and arrangement of the collections, which deservedly earned for him the praise of entomologists both in Australia and abroad.

"His knowledge of Australian Coleoptera, Diptera, and Hymenoptera was probably unsurpassed, in the study of which he devoted all his spare time. Every week-end and all his holidays were devoted to field work, the bulk of his gatherings being added to the Museum collections.

"His name is frequently mentioned in the publications of Dr. E. W. Ferguson, H. J. Carter, A. M. Lea, Dr. R. J. Tillyard, and others in acknowledgment of advice and assistance Although always ready to help others, and especially beginners, he could not be persuaded to put his knowledge into print. Much valuable information which he accumulated, and which took considerable time and effort to obtain, has thus to a large extent been lost.

"Apart from entomology, Mr. Spry was a well-known student and collector of coins, prints, &c., relating to the early history of Australia, and for some time was a member of the Historical Society of Victoria.

"His loss will be keenly felt among the large circle of friends and co-workers with whom he was so long and closely associated, but by none so much as his colleagues at the Museum."

Mr. F. Chapman, A.L.S., palæontologist, National Museum, Melbourne, writing in appreciation of Mr. Spry's geological investigations, says:—

"I well remember attending the first meeting, after my arrival in Melbourne, of the Field Naturalists' Club, and being introduced to Mr. Spry by the late Dr. T. S. Hall. He remarked, 'Here is a man you must know, for he discovered Bather's new crinoid.' The fossil crinoid referred to, which Mr. Spry had found near the old pumping station outside the Botanical Gardens, was only one of many hundreds of wonderful discoveries he made in working over the mudstone of the Yarra improvements. For instance, nearly all the graptolites found there were revealed by his hammer, and these, with many distinct types of Orthoceras now in the National Museum, would certainly have been lost to science but for his timely collecting.

"Like the author of 'The Old Red Sandstone,' Mr. Spry's

earlier occupation as a stonemason led him to take particular notice of the fossils in the stones upon which he worked; and later, as contractor's foreman in the sewerage works round Melbourne, he had ample opportunity, of which he availed himself to the full, of collecting the various fossils found both in the bedrock and in the Pleistocene. In the latter formation he came across some interesting clay nodules containing plant remains, that had been formed in the bywash of the old Yarra at South Melbourne more than ten thousand years ago. These I described in the *Geological Magazine* for 1906, and the type example is exhibited in the National Museum. Of the more notable finds of Mr. Spry in the Melbournian mudstone we may particularly mention the wonderful brittle-star, *Gregoriura spryi*, lying, in all its perfection, with slender, flexuous, and spiny arms, on the fine, hardened mud of the South Yarra Silurian.* These specimens, type and counterpart, now repose in the collection of the National Museum. Just prior to 1902 Mr. Spry had found several curious fossil impressions like the helical uncoiling of a fern tip, and which were then provisionally placed with the convenient group of the 'fucoids.' After seventeen years slightly better examples of these forms were found at Keilor by Mr. A. James, B.A., and it gave one much satisfaction to find them to be an almost unique occurrence of the gill impressions of Silurian worms (Trachyderma), closely related to the living Sabella and Serpula.

"Although his later years were well occupied with entomological studies, Mr. Spry found time to take several geological trips, in which it was sometimes my privilege to join; and the keen eye and skilful hand that he showed in this work was worth witnessing. In his reading he spread himself so widely that it was astonishing to find he was conversant not only with general geological works, but more especially with those bearing on entomology in regard to travels and distribution. Fabre's works he revelled in, though not always agreeing with Fabre's conclusions. Mr. Spry was especially fond of historical literature, and at times one would find him reading such works in the original French. Of a philosophic bent, we would show by his reasoning a deep insight into the wonderful economy of the insect world, and it is to be regretted that he did not place his knowledge on record. His monument is in the memory of his colleagues and in the practical achievements he has left behind."

His remains were interred in the Melbourne General Cemetery on Wednesday, 9th August, in the presence of quite a number of his fellow-members who desired to show their respect for their old friend.

* Illustrated in "Australasian Fossils," Chapman, p. 143.—Ed. *Vict. Nat.*

ABORIGINAL IMPLEMENTS.

ABSTRACT OF A PAPER READ BY DR. GEO. HORNE, V.D.

(*Read before the Field Naturalists' Club of Victoria, 10th April, 1922.*)

THERE are in Australasia four areas, at any rate, which have marked differences, as well as marked resemblances, in their stone implements—

1. The first is the East Coast, extending from beyond Brisbane to Cape Otway in Victoria. This was inhabited by natives who traced their descent through their fathers.

2. The second is the eastern inland district, which stretches from the coastal range to about the Queensland border and Lakes Eyre and Torrens. These trace their descent through their mothers. (I am dealing particularly with those near Lake Eyre.)

3. The third extends west and north from Lake Eyre. The natives of this district are paternal in tracing their descent.

4. The fourth area is Tasmania.

Taking first the stones that are universally present, we have the hand scrapers. These have an oval chipped end, and a handle which is twice as long as its breadth, or even more, but sometimes it is only a little longer than it is broad. They have this peculiarity: there is a flat side and a keeled side. This keeled side has in many cases a piece of the keel chipped off, to make a place on which to put the finger. For these stones I have adopted the name of "kálărā" by which the natives east of Lake Eyre call them. The kalara as found in Tasmania is absolutely undistinguishable from the Lake Eyre variety, as are also the East coast specimens. It is world-wide in its distribution, being found in England and France, as well as America, South Africa, and Japan.

Turning, then, to the scrapers which are used in one district and not in all, one finds the "thumb-nail" (fig. 1), which is

Fig. 1.

a small, very well chipped example of the kalara. These are found in great profusion near Melbourne, but there are none

amongst the maternal aboriginals of Lake Eyre. To the west of Lake Eyre, amongst the paternal natives, they appear again.

Another example may be found in the long, flaked knife. Amongst the central maternal folk this is made of a chert which chips with a sharp edge. The specially coveted one is as long as possible, and is slightly hooked at the end. They are covered at the blunt end with mindrie gum. The smaller knives are, however, marked for gripping, and are used in boys' fights or for general service. The East Coast had many similar knives (fig. 2), but they were throughout of a lighter

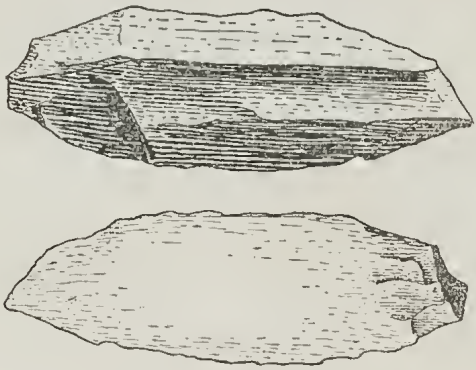

Fig. 2.

character; sometimes they have a chipped edge, which may be serrated.

The Tasmanian knife is a long blade, almost always with a chipped edge, though a few flake knives are found.

The chipped-back knives of Etheridge are a peculiar East Coast trait. They are found in two shapes, and have several minor differences. These are shown in fig. 3 and fig. 4. The former are found all along the coast; the latter

Fig. 3.

Fig. 4.

abound in Victoria, and some few are found to the west of Lake Eyre, where the Arunda men know them well. To the east of Lake Eyre they may be found, but the present inhabitants do not know them. It is significant that the East Coast and also the Arunda are paternal natives. Only the double-pointed ones (fig. 5) are found among these folk. None

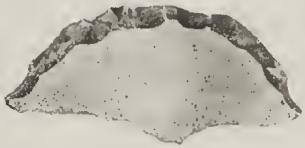

Fig. 5.

of them are found in Tasmania. All the small chipped-back knives and thumb-nail scrapers are classed by Breuil as Tardenoisian.

Another form of knife, the leaf-shaped flake, is one that is specially used for the circumcision operation in the Lake Eyre district. It may also be used for general surgical purposes, such as making tribal marks, &c. A similar knife (fig. 6) was in use among the East Coast natives, and on both

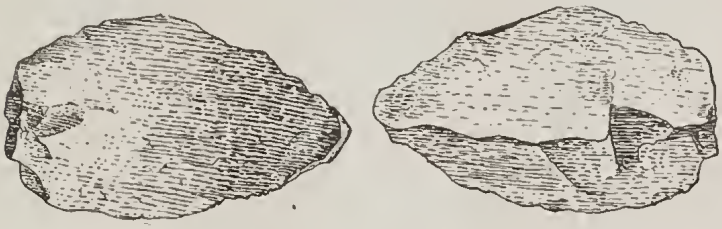

Fig. 6.

the mark for the finger or thumb was made. The East Coast natives differ from the others in the vast numbers of minute copies of larger implements to be found there. These seem to have been made for the children to practise with. Children are carefully considered amongst the Lake Eyre tribes, small implements being specially made for them.

When one takes into consideration the polished axes and knives, the rough workmanship of most of the implements, and the carefully made Tardenoisian forms, one cannot help thinking that in France these would be called Campigian, or certainly pre-Neolithic in age.

FLORA OF SOUTH AUSTRALIA.—The South Australian Branch of the British Science Guild, in pursuance of its policy to issue handbooks on the flora and fauna of the State, has issued the first part of the "Flora of South Australia." This has been written by Mr. J. M. Black, author of that excellent work on "The Naturalized Flora of South Australia." He has done his work well, but we fear it is far too scientific to become a popular handbook such as we presume was the idea of the Guild. Of course, it is difficult to determine what should be included and what should be left out in such a work, and

perhaps it is better to err on the side of including too much detail. The part under notice, being arranged on the system of Engler, commences with the ferns and extends to and includes the orchids, barely perhaps one-fourth of the plants of the State. The orchids have been dealt with by Dr. R. S. Rogers, the well-known authority on that group, and are treated very minutely, with some excellent drawings by Miss R. C. Fiveash. Following recent botanical publications of a country the introduced plants are included in their systematic positions. The author's introduction explains the scope of the work and other points. Then an excellent sketch of the workers on South Australian plants and previous publications is followed by a very complete glossary of botanic terms. As the dimensions of the plants dealt with are given in terms of centimetres, a very handy measurement scale is included, which should prove of great service. Altogether the publication, which has been produced by the Government printer, is a valuable addition to the State floras of Australasia. Its price is three shillings, and Victorian botanists will find it a useful investment, for many of the plants described are found also in this State.

"Journal of the Royal Society of Western Australia."—The volume of this publication (vol. vii., 1920–21) recently issued contains several interesting and important papers, notably two by Mr. D. A. Herbert, M.Sc., Economic Botanist and Plant Pathologist, Analytical Department, Western Australia, on parasitism of the Quandong and on parasitism of the Sandalwood. The Quandong, *Fusanus acuminatus*, R. Br., was found to be parasitic on *Acacia acuminata*, *Eucalyptus laxophleba*, and *Daviesia euphorbioides*. The Sandalwood, which is a valuable tree commercially, was also found to have *Acacia acuminata*, the Raspberry-jam Acacia, as its favourite host. Efforts to raise young Sandalwoods seemed to prove that a host plant is essential to it.

"Half-Hours in the Bush-House." — Many field naturalists who do a little in the way of pot-culture of plants they find, or of others they are interested in, will find in Mr. A. E. Cole's little volume a great deal that will both interest and instruct them. It is clearly written, in simple language, with many figures in illustration of the author's remarks and ideas. All types of plants are dealt with in his notes, such as bulbs, ferns, palms, foliage plants, creepers, orchids, ornamental grasses, and shrubs, so, whatever may be the favourite group, the reader is sure to find something applicable to his fancy. The author has been good enough to insert the derivations of most of the names of genera used, which helps considerably in remembering the proper names of the various plants. The work is published by Messrs. Angus and Robertson, at the price of five shillings.

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— OF —

The Field Naturalists' Club of Victoria.

Published 5th October, 1922.

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The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	67
A Simple Study of our Common Serpulid. By P. C. Morrison	70
Notes	69, 75, 76

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1922.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 9th OCTOBER, 1922.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Miss Daisy King, 23 Locke Street, Essendon.	Miss R. Chisholm.	Mr. H. Hughes.
Miss Marjorie Warner, Hampton Street, Hampton.	Mr C. Oke.	Mr. O. Daley, F.L.S.
Mr. J. S. Anderson, 17 Chrystobel Crescent, Hawthorn.	Mr. C. Oke	Mr. A. Scott.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

   By Mr. C. Oke—"An Entomologist in the Dandenongs in Winter" (*contd.*)

   By Mr. A. D. Hardy, F.L.S.—"Notes on the Measurement of Trees."

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

The Victorian Naturalist.

Vol. XXXIX.—No. 6. OCTOBER 5, 1922. No. 466.

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 11th September, 1922.

The president, Mr. C. Daley, B.A., F.L.S., occupied the chair, and about fifty members and visitors were present.

REPORTS.

A report of the excursion to Warrandyte on Saturday, 19th August, was, in the absence of the leader, Dr. C. S. Sutton, given by Mr. F. G. A. Barnard, who said that a party of about forty members and friends had proceeded to Warrandyte by char-a-banc and had had an enjoyable afternoon, though soon after starting a severe hailstorm had been encountered. On arrival at the "Pound Bend" members alighted from the vehicles and walked along to the river-bank in order to see the Silver Wattles, *Acacia dealbata*, in bloom. These were found to be at their best, and occasional beams of sunshine lighting them up made the sight very beautiful. A few other flowers were collected, and after afternoon tea the party returned to town.

A report of the excursion to Bayswater on Saturday, 2nd September, was given by the leader, Mr. E. E. Pescott, F.L.S., who said that quite a large party assembled at the "Basin" in order to view the nursery of Mr. Bert. Chandler, where a number of native shrubs are being culitvated in quantity for the cut-flower trade. One of the greatest favourites with the public is the Western Australian Boronia, *B. megastigma*, which, under treatment here, grows to greater perfection than in its native state, while the flowering period has been so extended that flowers are obtainable during nearly six months of the year. Other favourites grown are *Thryptomene Mitchelliana*, *Lhotzkya genetylloides*, and *Boronia pinnata*, while others are being tried. Several acacias were in full bloom, and added to the colour scheme of the nursery. Mr. Chandler kindly allowed the visitors to help themselves to his flowers, which privilege was much appreciated.

A report of the excursion to Bendigo on Saturday, 9th September, was given by one of the leaders, Mr. C. Daley, F.L.S., who said that the Melbourne contingent of the party numbered five, but his local co-leader, Mr. D. J. Paton, brought three more with him, so that nine altogether participated in the outing. The first direction taken was towards Ironstone Hill, to the north of Bendigo, where it was found that the

country was suffering from a dry winter, consequently flowers were scarce, but several acacias, such as *A. pycnantha, A. calamifolia,* and *A. leprosa,* made a fine show. The following day the party went in the opposite direction, to South Mandurang, where they found an abundance of flowers, Eriostemons, Grevilleas, and Acacias being very conspicuous. Orchids, though numerous, were confined to a few species. The entomologists were very pleased with the result of their efforts, several very interesting species and larvæ being taken.

ELECTION OF MEMBERS.

On a ballot being taken, Mrs. E. Coleman, "Walsham," Blackburn-road, Blackburn; Miss E. Hewitt, "Strathroy," Barker's-road, Hawthorn; Mr. A. Brown, B.A., LL.B., 27 Wattletree-road, Malvern; and Mr. C. Wilkinson, Grove-road, Hawthorn, were duly elected as ordinary members, and Master H. Wentworth, Wellington-street, Kew, as an associate member of the Club.

GENERAL BUSINESS.

Mr. A. E. Keep referred to the alarming increase in the export of live Australian birds to foreign countries, and the great losses by death resulting from the practice. Some discussion ensued, which was unanimously in favour of some steps being taken to regulate or abolish the export of live specimens of the Australian fauna, and the matter was left in the hands of the committee to confer with other bodies, and make representations to the Government on the matter.

PAPERS READ.

1. By Mrs. E. Coleman, entitled "Some Autumn Orchids."

The author, in a chatty paper, dealt with the various species of terrestrial orchids found during the autumn months. The first to claim attention was the sweetly-scented *Eriochilus autumnalis,* which often occurs in great quantities in April and May. In March may be found representatives of the genus Prasophyllum, mainly the smaller forms. Some of the "Greenhoods" (Pterostylis) commence their flowering period in the autumn. Another autumn orchid, *Chiloglottis dyphylla,* flowers during May. Altogether, the paper proved most interesting, and considerably enlarged members' ideas as to the variety of orchids to be found during April and May.

Some little discussion ensued, in which Mrs. Coleman was congratulated on her paper.

2. By Mr. C. Oke, entitled "An Entomologist in the Dandenongs in Winter."

Owing to the lateness of the hour only a portion of this paper was read, but the author gave sufficient of his notes to prove

that winter is not such a blank for insects as is usually supposed, and that in a district like the Dandenong Ranges, by careful search, species of nearly every order may be found.

EXHIBITS.

By Mr. F. G. A. Barnard.—Pot-grown orchid, *Pterostylis nutans*, in bloom.

By Mr. F. Cudmore.—Aboriginal spear-head from Oodnadatta, Lake Eyre district, South Australia.

By Mr. C. Daley, B.A.—Flowers of *Eriostemon obovalis*, *Grevillea aquifolia*, and *Tetratheca ciliata*, collected at Bendigo excursion: also flowers of *Thryptomene Mitchelliana* and *Bæckea plicata*, grown at Caulfield.

By Mr. J. E. Dixon.—Cabinet drawer of Victorian Paropsis beetles (Ladybirds), comprising 76 species.

By Mr. E. R. Hammet.—Aboriginal chisel from Upper Goulburn, Victoria; sulphur from Tikitere, Rotorua, N.Z.; and stone axe from Fiji.

By Mr. E. E. Pescott, F.L.S.—Orchid, *Caladenia pumila*, Rogers, new to science, collected at Bannockburn, Victoria, by Miss B. Pittard, September, 1916; flowers of *Acacia elongata* and *A. Howittii*, species suitable for hedge purposes; flowers of *Thryptomene Mitchelliana*, gathered six weeks previously: also an aboriginal stone implement used as an axe, a rubbing and chipping stone, and also a hammer.

By Geological Survey of Victoria (per Mr. A. E. Rodda).—Pseudomorphic crystals of limonite after pyrite, from Dunolly.

By Mr. A. E. Rodda.—Photographs of nests and eggs of following birds—viz., Flame-breasted Robin, Brown Tit-Warbler, White-shafted Fantail, White-browed Scrub-Wren, Crescent Honey-eater, and Pilot-bird, from Walhalla district.

By Mr. A. L. Scott.—Rock specimens from Tarawera, New Zealand.

By Mr. H. B. Williamson, F.L.S.—Orchids, *Lyperanthus nigricans*, Red-beak Orchid, and *Caladenia cærulea*, Blue Caladenia, from Cheltenham.

After the usual conversazione the meeting terminated.

CORRECTION.—In the September *Naturalist*, page 60, line 14 from bottom, Mr. J. A. Kershaw, F.E.S., was referred to as "zoologist" of the National Museum; his official position is Curator.

PERSONAL.—Mr. C. French, jun., Government Entomologist, has been appointed lecturer on agricultural entomology in the course for the degree of Bachelor of Agriculture in the University of Melbourne.

A SIMPLE STUDY OF OUR COMMON SERPULID.

By P. C. MORRISON.

(*Read before the Field Naturalists' Club of Victoria, 10th July, 1922.*)

IN order that students of the natural history of any object, whether it be animal or vegetable, may be able to base their remarks on some recognizable foundation, such objects have been classified by investigators into groups—at first very comprehensive—based on general structural features. These are gradually narrowed down by the separation of the objects under consideration into smaller groups possessing distinctive features, and so on till we reach a group containing few differing features, which, for convenience, is termed a genus.

Now, the animal about which I propose to give some notes to-night belongs to the family Serpulidæ. This is an important group of the sub-kingdom or phylum known as the Annelida —the segmented worms—which includes nearly all worms except parasitic ones. The members of this phylum are characterized externally by the division of the body into rings or segments, as in the common earthworm. This characteristic alone would not be a sufficiently important one upon which to form a phylum were it not for the fact that the rings are only an outward indication of a very important and typical internal structure. In all the worms belonging to this phylum we find the body divided into a number of chambers or somites by transverse walls or septa, corresponding to one or more of the external rings, each somite being a repetition of the last, bearing a more or less complete set of organs.

Phylum : ANNELIDA.

Class 1.—HIRUDINEA : Leeches.

Class 2.—CHÆTOPODA : Worms provided with bristles for locomotion.

Order 1.—Oligochæta.—Bristles few in number : Earthworms.

Order 2.—Polychæta.—Bristles numerous : Marine worms.

The Polychæta include seven sub-orders, which are collected under two branches—

Branch 1.—Phanerocephala : free-living or burrowing forms (contains five sub-orders).

Branch 2.—Cryptocephala : tube-building forms.

Sub-order 1 — Hermelliformia — a small, unimportant group containing only two species.

Sub-order 2—Sabelliformia—containing the remainder of the tube-building polychætes.

There are four families of Sabelliformia, of which we need to mention only one—Serpulidæ, to which the serpula belongs. It is worth noting that it is impossible to give the species of

any of our Victorian serpulæ, as no work has yet been done upon them, the genus, Serpula, being the furthest we can go up to the present in classifying them. This is just one of many lines of investigation open to workers in a Club such as our own who care to delve deeper than ordinary superficial interest in natural history.

Now that we have got over the least interesting, although by no means the least important, part of our subject, and have seen just what place the object of our studies occupies in the general scheme of things, let us go back and briefly examine the group of polychætes as a whole. Both free and tube-building forms are common objects on our seashores, living for the most part between tide-marks in rock pools.

The commonest of the free-living forms is perhaps Nereis, the common sand-worm of the angler, to be found among the rocks and sand all round the Bay here. This, in common with many other free-living forms, has horny jaws and teeth which can be protruded from the mouth or withdrawn a considerable distance down the "throat" at will. These jaws in the retracted condition can be well made out in the specimen exhibited.

A curious form sometimes found about here is the sea-mouse, Aphrodite, in which the bristles are long and fine and cover the whole of the back, giving the animal the appearance of a small mammal rather than of a worm.

Another similar form is protected by dorsal plates, giving it much the appearance of a tiny armadillo. It belongs to the genus Polynoë, and is sometimes found round our shores.

The two latter are not so often found by the shore collector, as they prefer to live in a moderate depth of water, where they walk along the sea-bottom in search of prey. Only a few of the polychætes are pelagic and swim in the open ocean. One of these is Tomopteris, which zoologists have had brought before them a good deal lately as a favourable object for research in certain branches of cytology, owing to the brilliant work of A. and K. E. Schreiner.

The tube-building forms are all more or less profoundly modified for their mode of existence. Respiration can, of course, be carried on only by exposed parts of the body—*i.e.*, the head end—and so, instead of having a row of small gills down each side, as do most of the free-living forms, they have a tuft of enormously-developed gills at the head, sometimes in the form of long unbranched threads, as in Terebella, but more often as a pair of large, brightly-coloured, much-branched structures, each primary branch being pinnate. The latter condition holds in Serpula, to which we will confine our remaining remarks.

Perhaps one of the commonest objects round our coast is the white incrustation of twisted, worm-like tubes so often found covering rocks and piles up to low-water mark, and sometimes between tide marks. These tubes are secreted by the Serpula, and, even if they are uninhabited, they are worth examining. They are more or less rough outside, but always very smooth within for the reception of the body of the inhabitant. With a little care specimens may be obtained from round our coast, in different parts, showing a regular gradation from a perfectly round exterior to a form with five or six longitudinal ribs, as can be seen also in an extinct form, *S. ouyenensis*, found in Victoria. In every case, however, horizontal rings are well marked, each (like the annual rings in the trunk of a tree) denoting a period of growth of the tube. If we have the good fortune to find the animal at home, as we are certain to do if the specimen has been under water when collected, we have much more to see. At first it appears that each tube is blind at its outer end, for it is blocked up by a perfectly-fitting white disc; but if the specimen be placed in sea water for a few minutes and allowed to remain undisturbed, the disc at the end of each tube will be seen to move outwards, allowing two beautiful variegated plumes to emerge. These plumes are the breathing apparatus of the animal inhabiting the tube, and have on them eyes, which, while unable to form a definite image, are able to perceive differences of light and shade, thus giving the animal warning of the approach of danger. The delicate plume-like gills are also apparently endowed with a very delicate sense of touch, for they can detect the presence of even very slight currents in the water. This the writer has proved by producing slight currents by means of a fountain-pen filler drawn out to a very fine point. Very slight disturbances were found to cause the animal to place itself with its gills across the direction of the current, exposing as large a surface as possible to it, probably with a view to obtaining food, for the gills serve the additional purpose of food capture. If, however, the intensity of the disturbance was increased, the animal would retract sharply into its abode, the disc, which is really the base of an inverted cone or operculum of horny material, effectively closing the mouth of the tube against possible enemies. This is interesting in view of the fact that each animal in the colony is continually producing a current while the gills are expanded by means of fine hairs or cilia covering the whole of the gill branches and pinnæ, and, while the cumulative action of all the members of a colony must produce a very noticeable disturbance, each individual seems easily capable of discriminating between this and a current produced by some external agency. The purpose of

the current produced by the colony seems to be to waft the prey to the tentacles, as the animal is incapable of protruding far out of its tube.

If the tube be carefully chipped away, leaving the body of the animal exposed, we are able to learn much more of our friend's anatomy. He has a body not unlike that of an ordinary thin earthworm, and the bristles on the hinder part cannot be seen with the naked eye. The front part, however, is typical of nothing but the group under consideration, as it is an adaptation to a peculiar mode of existence A shield-like expansion, the thorax, covers the front part of the animal, and possesses at its free edges tufts of setæ or bristles, which, by gripping against the sides of the tube, enable the animal to get a purchase, and so advance and retract easily and quickly in the tube.

The thorax is more robust than the hinder part of the body, which, under normal conditions, is never exposed outside the tube. It is the thorax, too, which secretes the shell, and which smooths the inner surface for the comfort of the tender, vulnerable tail portion. The mouth is very inconspicuous, and is situated as a small hole between the bases of the gills, which act as lips.

At the tail end the tube is usually closed, and so there must be some mechanism provided for the disposal of poisonous excretory products, which are discharged from the anus at the tail and also from a pair of excretory pores in each of the numerous segments of the animal. For the attainment of this end a ventral groove runs from the tail to the mouth of the tube, and into this the excretory pores open. Along each side of this "gutter" is a row of fine hairs or cilia which continually waft a stream of water from tail to head, thus sweeping away all harmful products as they are discharged from the body, while pure sea-water flows in from the gills and down the back to keep the gutter supplied with water. This channel also serves to liberate the eggs, which are fertilized after leaving the tube by spermatozoa liberated in the same way. The action of this ciliated gutter can sometimes be beautifully seen in a specimen removed from its tube and placed in a watch glass containing some sea water into which a little carmine has been dropped. Streaks of carmine are quickly formed along the lines of the currents, showing them up very distinctly. This is a standard method in work with living animals under the microscope, as the carmine, although it is in a very fine powder, is yet insoluble, and so cannot harm the animal or produce abnormal actions. One specimen the writer was examining thus *in nudo* laid a number of eggs while under observation, and, although there was no tube present, yet

these were carefully wafted along this channel for the full length of the animal, and then cast away from the head end, the slow procession of little white spheres along the undulating contour of the animal presenting a really beautiful spectacle.

The internal anatomy of the animal, except in so far as has been already mentioned, depends for its study so much upon microscopical technique and trained observation as to be, in the opinion of the writer, beyond the scope of an elementary study such as the present one, and so any attempt at describing it has been omitted.

I have hitherto spoken of the Serpula as an animal of absolute stationary abode; but this is not in all cases strictly correct, as among these tube-building worms, and especially among the serpulids, as being the commonest of the type, we find many examples of commensalism. This is a mode of life in which two or more animals, often of widely differing natures, live constantly together, usually for mutual benefit, and at least never to the detriment of either, "sharing the same table," as the term denotes. One has seen serpulids growing on living crayfish and crabs, sea-urchins, and shell-fish of various kinds, all of which enable the worm to obtain food more easily, as they move from place to place, and so take their passengers continually to fresh fields and pastures new, instead of leaving them wholly dependent upon the whim of the ocean currents to bring their food to them; and, of course, the larger animals often drop "crumbs" of their meals, which are usually carried to the expectant gill tentacles of the waiting serpulid. In return for these kindly offices of its host the Serpula endows upon it the magic cloak of invisibility, for at the approach of danger the larger animal has only to remain still and it is indistinguishable from the surrounding serpula-covered rocks among which it makes its home. One such specimen as this—a periwinkle, completely encrusted with Serpulæ—it was the writer's good fortune to obtain at Brighton recently, and it was a worth-while entertainment to sit and watch the evolutions of the little family in a small glass aquarium, the periwinkle crawling along the glass and rocks like a snail housed, apparently, in a living mass of brightly-coloured waving plumes. Unfortunately, a saltwater aquarium is a difficult thing to keep in order at any considerable distance from the sea, and soon the host and his precious burden, no doubt affected by the discharge of poisonous matter into the water by all the inhabitants, became lethargic and died.

Serpulids and their allies have been found as fossils in Victoria, *S. ouyenensis* being found fairly freely in a bore at Ouyen at a depth of up to 600 feet, and members of other genera have also been described by Mr. F. Chapman, to whom

I am indebted for any information I possess regarding these fossil forms. The oldest of these representatives of a bygone age are perhaps 60,000,000 years old.

In conclusion, a few words about general zoological research methods for those desirous of taking up such work might not be amiss. From the point of view of the systematist, the most important work to be done on any new animal is a minute and exhaustive study of its structure, and a comparison of it with that of other related forms. Each part should be minutely examined, described, and drawn, no detail being too small to merit attention. In the polychæta, for example, among the free-living forms particularly, there are a number of species very similar externally which are identified by the various forms of their bristles, which are very constant in any one species, but which differ considerably in shape in different species otherwise similar. Of course, each species will differ from others in more particulars than this one, but this is the most trustworthy for purposes of identification.

In addition to outside appearance, internal structure has often to be examined. In the case of most animals this can be done by ordinary dissection, but in small forms such as these worms more can be learned by cutting the whole animal into sections and studying these under the microscope. In many cases, however, this work, which is rather tedious and exacting, may be omitted unless a whole group is being examined and classified. The structure being known, the habits of the animal and its relation to its environment are the next things to be determined, and usually the last thing to be done is to study the development from egg to adult.

And now, as a final word, I would commend to all workers or intending workers along the field of zoology in this Club the remarks of Sir Baldwin Spencer at our recent exhibition anent the need for work to be done on our Australian fauna, and would emphasize the fact that, at least among our tube-building polychætes, we are uncertain in many cases even of the genera to which they belong.

EXHIBITION OF WILD-FLOWERS.—Members will be pleased to learn that the annual exhibition of wild-flowers, held on Tuesday, 3rd October, while this number was being prepared for issue, was again an unqualified success. The attendance of the general public was good, while the variety in the exhibits has seldom been exceeded. Full details of the exhibition will be given in the next *Naturalist*. The committee desires to thank members and friends of the Club for their kindly co-operation in what has become a "looked-for" fixture in the social life of Melbourne, and with this, as in previous

exhibitions, a way of raising money for a deserving charity. It is expected that the Children's Hospital will receive at least £50 through the effort.

"Australian Nature Studies."—Just as we go to press copies of this long-expected work by Dr. J. A. Leach are available. The volume, which extends to over 500 pages, should be a valuable addition to the libraries of nature study teachers, being well illustrated with about 2,000 black and white drawings, besides six three-colour plates. A review of the work will appear in the next *Naturalist.*

"The Honey Flora of Victoria."—This is a reprint of a series of articles which appeared in the *Journal of Agriculture* during 1914–18. The author, Mr. F. R. Beuhne, Government Apiculturist, says in his foreword that the matter in the earlier articles has been brought up to date, but there is still much information wanted with regard to the apicultural value of our native vegetation, and it is partly with that view that the articles have been brought together and issued at the popular price of one shilling. It is hoped that those interested in bee culture will study what has been written, and will communicate with the author as to revision or extension of the statements. The work is illustrated with seventy figures, mostly eucalypts, and, in fact, with its excellent indices and lists of species, might almost be recommended as a handbook to the commoner species of our gum-trees. Notes on the Banksias, Tea-trees, Callistemons, and Grass-trees complete the work, which has been issued by the Government Printer.

Australian Bird Maps.—A bird-book of more than usual interest to bird-lovers is "Australian Bird Maps," by Robert Hall, C.M.Z.S., of Hobart, well known some years ago as a member of the Field Naturalists' Club of Victoria. In it, by the use of one hundred and one miniature maps or graphs representing Australia and the adjacent islands, &c., the author illustrates the distribution and seasonal movements of many of our notable birds, tells their mode of life, &c. The maps might have been on a rather larger scale without increasing the size of the pages, thus allowing the details to be clearer, while, had they been placed in close proximity to the reading matter referring to them, much turning over of pages would have been avoided. However, the volume, which has been published for the benefit of the boy and girl scouts of Tasmania, will be welcomed by students of bird-life; it reveals a deal of research and note-taking on the part of the author. Three plates of figures of birds illustrate the species referred to in the various maps. The work has been published at four shillings and sixpence, and we hope will have a ready sale.

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The Victorian Naturalist:

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— OF —

The Field Naturalists' Club of Victoria.

Published 9th November, 1922.

Hon. Editor: F. G. A. BARNARD, Esq

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	77
Exhibition of Wild-Flowers	80
Excursion to Bendigo	84
A Circuit of the Grampians. By J. W. Audas, F.L.S., F.R.M.S., National Herbarium, Melbourne	87
Book Notice	96
Notes	86, 95

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1922.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 13th NOVEMBER, 1922.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Miss. W. E. Graham, Spring Street, Melbourne	Miss R. Chisholm.	Mr. C. Daley, F.L.S.
Mr. E. J. Ingram, 133 Barkly Street, North Fitzroy.	Mr. F. Chapman, A.L.S.	Mr. H. B. Williamson, F.L.S.
Mr. R. T. Patton, Botanical Dept., University.	Dr. C. S. Sutton.	Dr. G. M'Callum.
Dr. S. F. Ridley, 1 Blythe Street, Brunswick.	Dr. C. S. Sutton	Dr. G. M'Callum.
As Country Members—		
Miss Helen D. Elder, "Kurac-a-rue," Rokewood.	Mr. G. Coghill.	Mr. F. Pitcher.
Mr. L. D. Cameron, "Coonara," 34 Prince Albert Street, Mossman, N.S.W.	Mr. C. Daley, F.L.S.	Mr. C. Oke.
As Associate—		
Mr. Ernest H. Thiel, Victoria Street, Doncaster.	Mr. F. G. A. Barnard.	Mr. C. Oke.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

   By Dr. MacGillivray—"A Trip to the North and North-West of Broken Hill."
   By Mr. A. D. Hardy, F.L.S.—"Notes on the Measurement of Trees."

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

The Victorian Naturalist.

Vol. XXXIX.—No. 7. NOVEMBER 9, 1922. No. 467.

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 9th October, 1922.

The president, Mr. C. Daley, B.A., F.L.S., occupied the chair, and about fifty members and visitors were present.

A report of the excursion to Cheltenham on Saturday, 16th September, was given by Mr. A. J. Tadgell, who acted as leader in the unavoidable absence of Mr. H. B. Williamson, F.L.S., stating that, notwithstanding threatening weather, a good party of members and friends had taken part in the outing. Quite a number of the early spring flowers were at their best; about seventy species were collected and named during the afternoon, and, in addition, twenty-two species of exotics were noted. Nine species of orchids were collected, of which the "Tall Diuris," *D. longifolia*, and the "Blue Fairies," *Caladenia deformis*, were the most admired. Other notable plants were the "Showy Bossiæa," *B. cinerea*, the "Hairy Aotus," *A. villosa*, and the "Scarlet Sundew," *Drosera glanduligera*.

A report of the excursion to Alphington on Saturday, 23rd September, was forwarded by the leader, Mr. J. Searle, who said that there was a fair attendance of pond-life enthusiasts, but there was nothing striking in the captures, the results being much the same as reported on previous excursions to the district.

A short report of the visit to Natya, *via* Piangil, on the Murray (below Swan Hill), from Saturday, 23rd September, to 2nd October was given by Mr. C. Oke, who said that the small party had worked enthusiastically and made a number of interesting captures, especially in entomology, which would be detailed at a later date.

The excursion set down for Toorourrong for Thursday, 28th September (Show Day), was not held, owing to the poor response by members.

A report of the excursion to Blackburn on Saturday, 30th September, was given by the leader, Mr. A. J. Tadgell, who said that again threatening weather had not damped the enthusiasm of a number of members in meeting for a ramble at Blackburn. However, at four o'clock rain put an end to work in the open, and the friendly shelter of a tea-room was sought, where the finds were discussed and suggestions were made for extending the usefulness of the Club and its objects. About seventy species of plants were noted and named, as well as

fifteen aliens. Of these, the "Golden Bush-Pea," *Pultenæa Gunnii*, the "Hop Bitter-Pea," *Daviesia latifolia*, and the "Narrow Bitter-Pea," *D. corymbosa*, were the most noticeable. Seven orchids were collected, all common species. Among the aliens noted was the "Wild Onion," *Nothoscordum fragrans*.

A report of the excursion to Langwarrin on Saturday, 7th October, was given by the leader, Mr. H. B. Williamson, who stated that an interesting day had been spent, mostly in quest of orchids, of which a dozen species were noted. Following the railway line, a turn was made towards Baxter State school, where, on a springy hillside, the Caladenias *deformis*, *Menziesii*, *carnea*, and *dilatata*, together with *Glossodia major*, *Thelymitra antennifera*, *Diuris longifolia*, *D. maculata*, *D. pedunculata*, and *D. palochila*, were gathered. Some were very much more plentiful than others. *Thelymitra luteo-ciliata* had been recorded from this neighbourhood, but diligent search failed to reveal a specimen; perhaps it was too early. After lunch a tract of "Sandringham country" was passed through, and *Caladenia Patersoni* added to the list. Further on the most important find of the day was made in *Burnettia cuneata*, of which three specimens were seen. Further search did not add to the list of species, and the evening train was taken for home.

ELECTION OF MEMBERS.

On a ballot being taken, Miss D. King, 23 Locke-street, Essendon; Miss Marjorie Warner, Hampton-street, Hampton; and Mr. J. S. Anderson, 17 Chrystobel-crescent, Hawthorn, were duly elected members of the Club.

GENERAL BUSINESS.

The hon. treasurer, Mr. F. Pitcher, reported that there would be a good credit balance as the result of the recent exhibition of wild-flowers, but as neither sales of tickets nor items of expenditure were all in yet he could not definitely state what amount would be available for division between the Club and the Children's Hospital.

The merits and management of the recent exhibition were freely discussed by several members, and from their remarks it is hoped some suggestions may be secured which will be of use on future occasions. It should be borne in mind, however, when offering criticism, that there is no comparison between the displaying of flowers in an ordinary horticultural show, where it is known beforehand what will be exhibited, and a wild-flower exhibition, where everything is an unknown quantity until the last moment. On this occasion the exhibition suffered considerably through exhibits being delayed on the railways and by carriers.

The chairman reported, with regard to the traffic in Australian birds and animals mentioned at the last meeting, that a representative deputation had waited on the Federal Minister of Customs on the matter, and had been received sympathetically, and a promise had been given that regulations would be framed to meet the wishes of the deputation and submitted to the interested societies for their approval.

PAPER READ.

By Mr. C. Oke, entitled "An Entomologist in the Dandenongs in Winter" (continued).

The author continued his remarks proving that entomology can be successfully followed, even in winter, in such varied country as the Dandenong Ranges, mainly owing to the amount of shelter provided by the dense vegetation.

The reading of the paper led to a discussion as to whether the red-striped spider or centipedes are really poisonous and dangerous to human beings. Mr. C. Cox said that he had "cured" a bite from a centipede by means of nicotine from a tobacco pipe. The chairman remarked that he had been bitten by a large centipede, but did nothing, and no untoward results happened. Mr. Oke said he doubted whether the red-striped spider was really dangerous, and thought that if any unpleasant results ensued it was due to the effects of fear or of the person bitten being in indifferent health. He had known of two persons being bitten who had not suffered more than if stung by a bee or an ant. Mr. J. A. Kershaw, F.E.S., said that Dr. W. Macgillivray, of Broken Hill, had told him that he had known of very painful results following the bite of this spider, and that he had treated several cases.

EXHIBITS.

By Mr. G. Coghill.—*Grevillea rosmarinifolia,* grown in his garden at Canterbury.

By Mrs. Coleman.—Orchids from Healesville.

By Mr. C. Daley, F.L.S.—Turquoise from King River, North-East Victoria.

By Mr. J. E. Dixon.—Forty-four species of Coleoptera; a rare fungus, *Battarrea phalloides*; scorpion from near the River Murray—all collected during the excursion to the Natya district.

By Mr. C. French, jun.—Orchid in bloom, *Dendrobium striolatum,* from Bairnsdale.

By Mr. C. Oke.—Arachnids, Myriapods, and insects in illustration of his paper.

By Geological Survey of Victoria (per Mr. A. E. Rodda).—Fossil plant impressions from coal bore, Mirboo.

By Mr. A. E. Rodda.—Photographs of native animals, as follows:—Wombat, Echidna, Koala, Ring-tailed Possum, taken at Walhalla.

By Mr. A. L. Scott.—Tarawera ejecta, collected from Frying-pan Flat side of Lake Rotomahana, New Zealand.

By Mr. H. B. Williamson.—Orchids, including *Burnettia cuneata*, from Langwarrin; specimen of Pink Bladderwort, *Polypompholyx tenella*, showing under the microscope the vesicles on the roots for the absorption of nutrient matter.

After the usual conversazione the meeting terminated.

EXHIBITION OF WILD-FLOWERS.

For this year's exhibition the Club was successful in securing the Melbourne Town Hall, and on Tuesday, 3rd October, it again presented a gay and animated appearance owing to the fine display of flowers and the large attendance of the public.

In the unavoidable absence of His Excellency the Governor-General, Lord Forster, the exhibition was opened by Sir Robert Best, M.H.R., who congratulated the Club on the excellent display and the good work it was doing in encouraging the growing of native flowers, and by means of these exhibitions bringing the attractiveness of our native flora under the notice of the general public. The president of the Club, Mr. Chas. Daley, B.A., F.L.S., in thanking Sir Robert Best for his kindly remarks, said that the Club had a members' roll of about 300 persons, but all were not interested in plants, such hobbies as butterflies, beetles, shells, or rocks each having its circle of votaries. The Mayor of Geelong (Alderman Hitchcock) spoke of the interest and pleasure to be derived from the cultivation of native plants in one's garden, saying that, as all our garden plants were derived from wild types, there was no knowing what results might be obtained by persistent cultivation.

On the platform was a fine display of cut flowers and foliage, forwarded by Mr. J. Cronin, Director of the Botanic Gardens. The flowers were all Australian natives, which have been growing in the Gardens for years, and included some very choice examples. Among these were *Olearia panosus* (Vic.), *Anopteris glandulosus*, the Tasmanian Larrel, *Chamælaucium uncinatum*, the Geraldton (W.A.) Wax-flower, also Chorizemas, Grevilleas, eucalypts, &c., from Western Australia—that land of wonderful flowers.

From the gardens of Mr. J. M. Watson, Balwyn; Mr. Geo. Coghill, Mr. F. Keep, and Mr. F. B. Sutherland, Canterbury; Mr. Alister Clark, Bulla; and Mr. S. Blake, Ivanhoe, came a large variety of cultivated Australian flowers, showing the

decorative value of many of our wild-flowers, while Mr. Russell Grimwade, of Toorak, showed blooms of *Eucalyptus Preissiana*, a Western Australian gum, grown from seed planted only four years ago. The blooms were very large and showy, being of a deep lemon shade. Mr. A. C. Chandler, of Croydon, exhibited an improved strain of Western Australian Everlastings, while Mr. B. Chandler, of Bayswater, forwarded some greatly-improved Boronia.

An interesting display of orchids was made by Mrs. Coleman (of Blackburn), Mrs. C. French, jun., and others, some forty or fifty species, collected at Healesville, Ringwood, Blackburn, &c., being staged; among these were *Caleya major*, the Flying Duck Orchid, and *Sarcochilus falcatus* (epiphytal). Orchids were also exhibited by Mrs. Best (Heyfield), Masters J. and N. Pescott, C. Resch, G. H. Jones, J. Hill, and others. The lady students of the Burnley Horticultural Gardens exhibited a fine collection of wild-flowers from Ringwood.

A number of willing hands, under the direction of Mr. H. B. Williamson, F.L.S., arranged the flowers as quickly as possible, mainly as to localities, but species of some of the more important orders were grouped together on special tables. As far as possible the flowers from other States were kept together.

Flowers came from all parts of Victoria, and the Club is deeply indebted to those members and friends who interested themselves in collecting and forwarding the many beautiful specimens. Mr. J. H. Maiden, F.L.S., Director of the Botanic Gardens, Sydney, sent a nice selection of New South Wales flowers. Mr. E. Ising, hon. secretary of the South Australian Naturalists' Society, forwarded a collection of South Australian flowers. From Western Australia a fine representative collection of about forty species was received, through Miss Fuller, from Miss A. Morgan, of Darlington. Some of these had been exhibited in Perth the previous week.

The usual difficulty was experienced in compiling a complete list of exhibitors, owing to the fact that many persons forward boxes without any indication of the sender's name or the locality where gathered.

As nearly as could be ascertained, about three hundred species of wild-flowers were exhibited. Mr. H. B. Williamson, F.L.S., contributes the following notes regarding some of the exhibits:—From Lorne the Rev. A. C. F. Gates, M.A., sent about fifty species, including *Phyllanthus Gunnii* and *Thomasia petalocalyx*, flowers not often seen. Bairnsdale was well represented by a nice lot sent by Mr. T. S. Hart, M.A., including *Pterostylis falcata* and *Eriostemon trachyphyllus*, From the Otway Forest some very fine blooms of *Prostanthera melissifolia*, *Phebalium* (*Eriostemon*) *Billardieri* (Satinwood), and

some serviceable fern roots were sent by Miss Lily Watson, of Laver's Hill. Miss Isobel Hislop, in conjunction with Willie, Millie, and Tommy Lucas, also sent from Carlisle River ferns as well as forest blooms, among which was a fine supply of a new species of Pultenæa I had lately described, but the description has not yet been published. The North-Eastern district was represented by Blue Peas, *Swainsona procumbens*, from Mrs. Read, of Springhurst, and orchids, Grass-Lilies, and Grevilleas from Mrs. J. W. Boucher, of Chiltern. Mr. T. A. Robinson, of Dutson, Sale, sent Sprengelia, *Dampiera stricta*, and the pretty pink *Sowerbæa juncea*. The Mallee district was in evidence mainly through the efforts of Mr. C. Oke, the hon. secretary, and the camping party at Natya, Mr. F. Holt, of the Water Commission, Bolton, pupils of the State school, Bolton, Miss Violet Hickey, Pinnaroo, S.A. (Murrayville plants), Mrs. A. M. Howard, of Golton South, near Lubeck, and Mr. J. P. Flynn, of Diapur. Mr. Oke had spent a week in the northern Mallee, and his contribution of plants from Natya contained the interesting Three-winged Blue-bush, *Kochia triptera*, the fruits of which rival in beauty the more common *K. villosa*. The Ming or Bitter Quandong (in fruit), several Cassias, including the rarer *C. phyllodinea*, and the Splendid Aster, *Olearia magniflora*, were among these plants. Mr. Bolton's contribution included the beautiful Orange Immortelle, *Waitzia corymbosa*, and the showy *Cassia Sturtii*. The well-known Fairy Wax-flower, the Anemone Boronia, together with six species of Acacia and seven species of eucalypts, and about a dozen other species, were sent from Bendigo by Mr. D. J. Paton. Among the eucalypts was the Blue Mallee, *E. fruticetorum* (*potybractea*), so famed for its oil of special quality. By the good offices of Mr. C. W. D'Alton, of Hall's Gap, a splendid show of Grampian plants was made, the favourites, Thryptomene, Lhotzkya, Bauera, and Calytrix, being in abundance. A welcome contribution was a large quantity of *Boronia pinnata*, obtained through the agency of the Misses Currie, of Lardner, and gathered by May Bingham, Betty Hardie, and Alice Maddock, of Jindivick. "Queen Bee" of the *Farmers' Advocate* was instrumental in obtaining contributions from several country "bees," among whom were the three girls mentioned above, Edna Samuel, of Lang Lang, and some whose "hum" has not reached us, though the honey has.

The following is a fairly complete list of localities from which flowers were received:—

North-West.—Natya, C. Oke and party; Hall's Gap, W. E. Warren, A. T. and C. W. D'Alton; Diapur, J. P. Flynn; Wedderburn, Miss E. Gray; St. Arnaud, Miss E. Edwards; Bolton, F. Holt; Golton South, *via* Lubeck, Mrs. Howard.

South-West.—Laver's Hill, Miss L. Watson; Carlisle River, Miss I. Hislop, Miss M. Lucas, Masters W. and T. Lucas; Lorne, Miss Anderson, Rev. A. C. Gates; Coleraine, A. M'Caskill.

North.—Taradale, Misses V. and E. Hansford, G. Coghill; Castlemaine, F. Shugg; Bendigo, D. J. Paton, H. C. James; Rushworth, F. Rich; Fryerstown, Miss G. Nokes.

South.—Hurst's Bridge, Miss Moffat, Miss Downing; Eltham, A. Tonge; Greensborough, — Ford; Digger's Rest, Miss J. M'Kenzie; Clayton, D. Morgan; Pakenham, F. Wiscwould; Seville, — Mezger; Boronia, Miss E. Mackenzie; Lang Lang, Miss E. Samuel; Red Hill, Dromana, G. Higgins; Sandringham, Misses H. and L. Kenvig, Miss G. Nokes; Black Rock, Miss Fordyce; Keilor, A. J. Tadgell.

North-East.—Lima East, Mrs. A. J. Evans; Chiltern, Mrs. J. W. Boucher; Springhurst, Mrs. J. D. Read.

East.—Jindivick, Misses Lyall, M. Bingham, B. Hardie, and A. Maddock; Drouin, Mrs. F. Dyall; Lardner, Miss C. C. Currie; Warragul, Miss V. F. Pratt; Heyfield, Mrs. Best; Dutson, T. A. Robinson; Bairnsdale, T. S. Hart; Gormandale, Rev. A. J. Maher.

New South Wales.—Mosman, L. Cameron; Rose Bay, A. N. Burns; Corowa, S. Singleton; Mulwala, Mrs. J. White; Terrigal, Mrs. T. G. Harris, H. C. Butler; and Hilltop, J. Chalker.

Under about a dozen microscopes, exhibited by Miss M. Harvie, Miss M. Gordon, B.Sc., Miss E. M. Derrick, B.A., Messrs. F. Chapman, A.L.S., G. Berthon, J. Stickland, P. C. Morrison, A. L. Scott, and F. H. Baker, were a number of interesting objects, such as sections of plant tissues, pond flora, common seeds, wood sections (fossil and living), pollen, and leaf hairs. These were much appreciated, judging by the numbers of persons always waiting their opportunity to see the slides; and thanks are due to the exhibitors for giving up so much of their time in the interests of micro-natural history.

A party of lady friends, under the direction of Miss Gabriel, conducted an afternoon tea stall, which resulted in £14 being added to the takings.

The sales of flowers and pot plants (native shrubs) were in the hands of Miss A. Fuller and a number of ladies, who were kept busy both afternoon and evening.

The thanks of the Club are due to the *Argus* for occasional paragraphs inserted previous to the day of the exhibition, and for an appreciative report the next day. The *Age* also published a good report, and was good enough to supply a large quantity of paper for covering the tables.

Decorative material for the hall was kindly supplied by the

Director of the Botanic Gardens, and by Mr. F. Pitcher, from Belgrave.

The financial result is not quite complete, but it is expected that at least £75 will be the Children's Hospital share of the profits.

EXCURSION TO BENDIGO.

ADVANTAGE was again taken of the Railways excursion to Bendigo on Saturday, 9th September, to make a fourth trip to that district and add a few more names to the list of plants recorded in previous *Naturalists* (Nov., 1919, December, 1920, and January, 1922). Splendid weather favoured us on this occasion, and an interesting time was spent, although, as the bush was suffering from a prolonged dry spell, the botanical results were not so good as usual. Our Saturday trip was to Ironstone Hill, about four miles due north from Bendigo. At many places in this part the soil has been repeatedly turned over; nevertheless fair botany is still available. The flora partakes something of the Whipstick formation, though only one isolated patch of *Eucalyptus viridis* was seen. Amongst Acacias, *A. acinacea*, *A. calamifolia*, *A. leprosa*, and *A. pycnantha* made the best show. Other notable plants were *Hybanthus floribundus*, *Bæckea diffusa*, *Westringia rigida*, *Lissanthe strigosa*, and the orchids *Pterostylis nana* and *mutica*. On Sunday we went by cab to South Mandurang, about eleven miles to the south, where we found a wealth of flowers. *Eriostemon obovalis* and *Tetratheca ciliata* were fine, and the three local Grevilleas—*G. lanigera*, *G. rosmarinifolia*, and *G. aquifolium*—were all found in quantity. Hardenbergia made a good display, and the wattles, especially *A. pycnantha* and *A. dealbata*, were at their best. Orchids were not common, with the exception of *Diuris maculata* and *D. pedunculata*. Others seen were *Pterostylis curta*, *P. nutans*, *P. nana*, and *P. longifolia*, and *Caladenia deformis*. Twenty-four species of flowers were found on Saturday, and forty-five on Sunday. Birds were not numerous. The Pallid and the Bronze Cuckoos were reiterant with their mournful notes, whilst the Crested Bell-birds at Mandurang were in full song. The Magpie-Lark, White-fronted Heron, Scarlet-breasted Robin, Wattle-birds, and Rosella Parrots were also seen.

Messrs. Thorn and Burns devoted themselves to entomology, and report as follows:—"Our main object at Ironstone Hill was to secure the larvæ of *Neolucia agricola*, a small butterfly of the order Lycænidæ. To obtain these the bushes on which they feed, *Daviesia ulicina*, had to be beaten. We were successful from the beginning, the first bush yielding six larvæ.

We had only to beat about a dozen bushes to secure all we desired. These were sent away at once by post to our fellow-member, Mr. G. A. Waterhouse, F.E.S., of Sydney, to be figured in his forthcoming work on the life-histories of Australian Rhopalocera. Another species which we were very anxious to secure was the form *simplexa* of *Candalides hyacinthina*, which occurs only in the Mallee and in South Australia. We were rewarded by capturing a female specimen in fine condition, near a patch of its food plant, *Cassytha glabella*. This butterfly was first recorded for Victoria in October, 1921. We also secured a female of *Neolucia serpentata*, and saw specimens of *Pyrameis itea* and *Pyrameis cardui Kershawi*, both common Victorian species. Moths were not plentiful, but several small species belonging to the genus Philobata and a fine Tortrix were secured whilst beating a bush of *Daviesia ulicina*. A large number of species of looper caterpillars—Geometrid larvæ—were also obtained whilst beating bushes. Beetles were scarce, only a few 'click' beetles, Elateridæ, being obtained under loose bark, while one species of ground beetle, Carab, was found beneath a stone. Hymenoptera (ants, wasps, &c.) were also scarce, one species of Thynnid (flower wasp), two species of native bees, and one species of Ichneumon (parasitic wasp) being taken. Diptera (flies) were also poorly represented, three species of Syrphidæ (hover flies) and the common blow-fly, Musca, being all that were noticed. Representatives of the remaining orders were absent. Sunday was fine and warm, with very little wind; our expectations at Mandurang were high. Two additional species of butterflies were captured—namely, *Nacaduba biocellata*, a small Lycænid, and *Candalides acasta*, also a Lycænid. More moths were also taken, including several more species of Œcophoridæ, while one fine Geometrid was taken on a small dead sapling. More larvæ were found whilst beating bushes. No more new beetles were taken. The warmth of the day greatly increased the number of species of Hymenoptera; four species of native bees were taken, three Thynnids, and about a dozen Ichneumonidæ. The ants noticed were the common red meat-ant, *Iridomyrmex detectus*, and one species of jumper, Myrmecia; one species of spined ant, Polyrhachis, the metallic ant, *Ectatomma metallicum*, and two species of small black ants, Cremastogaster. Representatives of several more groups of flies were also observed, including one Asilid (robber fly), three species of mosquito (Culicidæ), and representatives of the Muscidæ and Sarcophagidæ. Two species of dragon-flies were the only representatives of the order Neuroptera taken. A fine large scorpion was secured beneath a stone whilst searching for larvæ. As it was early in the season these results may be

considered fairly good ; the district should, however, prove very productive in the mid-season."

The following plants have not been recorded on previous excursions to this district :—

LEGUMINOSÆ—
Glycine clandestina.
Acacia dealbata.
LORANTHACEÆ—
Loranthus pendulus (fruit).
GOODENIACEÆ—
Goodenia geniculata.
EPACRIDEÆ—
Leucopogon virgatus.
Lissanthe (Styphelia) strigosa.
ORCHIDEÆ—
Caladenia deformis.

D. J. PATON.
CHAS. DALEY.

ETHNOLOGY.—The trustees of the Melbourne Public Library and Museums have issued a third edition of the "Guide to the Australian Ethnological Collection Exhibited in the National Museum, Melbourne." It is from the pen of Sir Baldwin Spencer, K.C.M.G., F.R.S., D.Litt., M.A., D.Sc., Hon. Director of the Museum. It extends to one hundred and forty-two pages, and is illustrated by 33 plates. The guide is far more than a list of exhibits. Each case is taken separately and its contents described, so that it becomes almost a handbook to the subject, and, as a large number of the objects were collected by the author, we may rest assured that the descriptions given of the uses of the various articles are correct, and not mere supposition. The museum possesses many more specimens than those on exhibition, limitations of space preventing many interesting items being placed on view.

THE MOLE AND FIELD CRICKETS.—The following extract from Dr. Leach's "Australian Nature Studies" may be taken as an example of the style in which the book is written :—"The burrowing mole-cricket is perfectly adapted for his burrowing life. His fore-legs are shovels and shears. They are supported on the large, well-developed fore-chest. Though ferocious-looking, the mole-cricket is a harmless, interesting animal. The burrowing may loosen and destroy some plants, but the ploughing and burrowing must do much good. The food is disputed ; possibly the animal is partly carnivorous. The black field-cricket is active and difficult to capture. Like the mole-cricket, it is musical, and produces sound in the same way—by rubbing the scraper of one wing over the file of the other. The overlapping fore-wings are large and turned down at the side to fit the body. The under-wings fold fanwise, projecting beyond the body. The cerci are long and pointed. The egg-placer is long also. A female field-cricket has, therefore, five long structures projecting past the body—two wings, two cerci, and an egg-placer. Mole-crickets have no egg-placer."

A CIRCUIT OF THE GRAMPIANS.*

By J. W. AUDAS, F.L.S., F.R.M.S., National Herbarium, Melbourne.

(*Read before the Field Naturalists' Club of Victoria, 14th August*, 1922.)

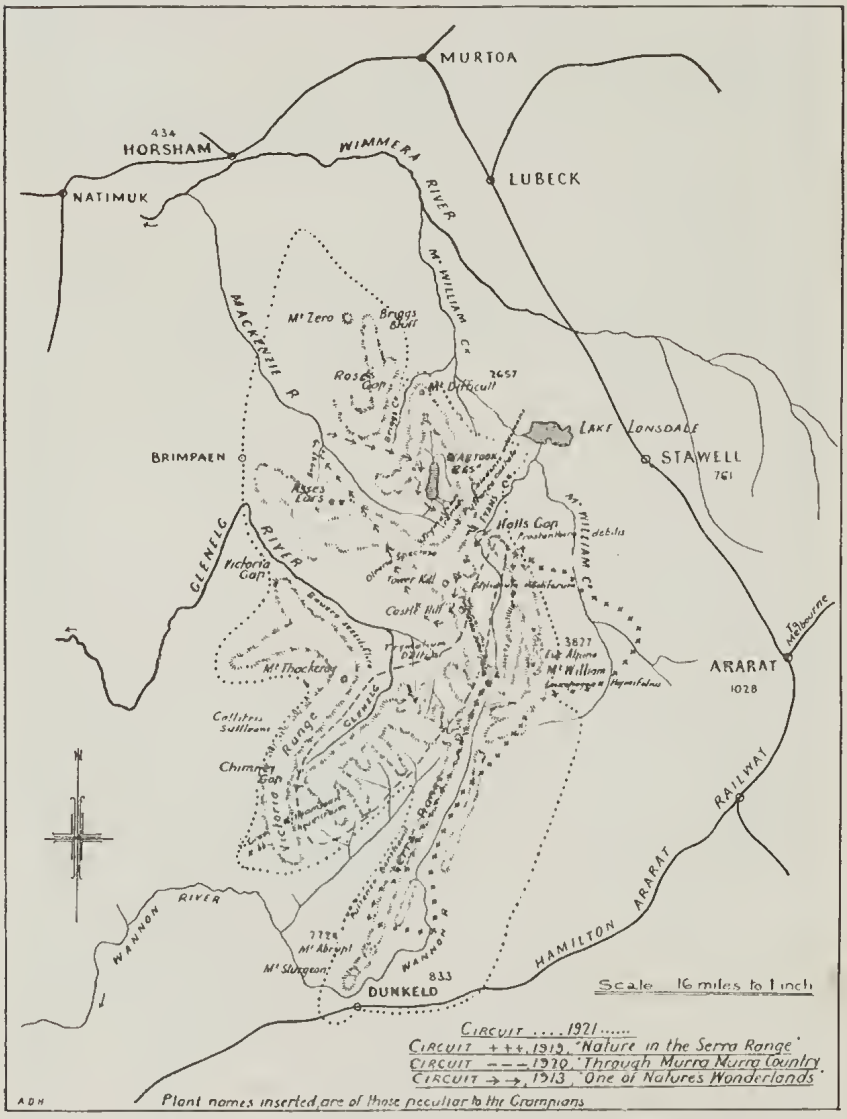
FOR the past ten years I have made an annual visit to the Grampians in the spring time, and have now completed a botanical survey of the entire area, which comprises about 450 square miles. On many of these trips I have been accompanied by my friend, the enthusiastic and experienced Mr. C. W. D'Alton, but on this latter occasion, when I purposed to encompass the whole district, I was fortunate in also having the company of Mr. A. T. D'Alton.

Having made so many trips to special parts during these ten years, there was really no particular locality in which we could hope to discover anything new or rare, and this fact confirmed my desire to make the round trip. Accordingly, we started from Hall's Gap in a comfortable waggonette drawn by two sturdy horses on Tuesday, 29th November, 1921. We found the roads rather cut up by heavy timber waggons for the first few miles, but as we passed Fyans Creek, and began to travel more elevated ground towards Mount Dryden, they improved. This hill differs in composition from the usual sandstone of the Grampians, for it is composed of basaltic rock. A circulating view from the summit reveals Lake Lonsdale, the Serra and Mount William Ranges, and the town of Stawell. Travelling northwards, we crossed the Little Wimmera River and rested for lunch. Profuse growths of sedges, grasses, and rushes along the river-bank here proved interesting, and we noted the prominence of the "Tall Spear-grass," *Stipa pubescens*, "Branching Rush," *Juncus prismatocarpus*, "Short-stemmed Sedge," *Carex breviculmis*, and "Common Bulrush," *Typha angustifolia*. It was a very pretty sight to watch a Black Duck sporting her young brood on a near-by pool, while a large flock of White Cockatoos circled, screeching, overhead.

Proceeding, we passed the homestead of Ledcourt station, and, the condition of the roads having greatly improved, we made rapid progress. Nearing Dadswell's, we entered heathy country, and beautiful flowering shrubs became much in evidence. There were many fine specimens of the "Cross Honey Myrtle," *Melaleuca decussata*. This is a very ornamental

* Previous papers by Mr. Audas are:—"One of Nature's Wonderlands—the Victorian Grampians," *Vict. Nat.*, February, 1913 (xxix., p. 146); "The Grampians Revisited," *Vict. Nat.*, June, 1914 (xxxi., p. 24); "Nature in the Serra Range," *Vict. Nat.*, April, 1919 (xxxv., p. 171); "Through the Murra Murra Country (Western Grampians)," *Vict. Nat.*, September, 1920 (xxxvii., p. 59); "Through the Balangum Ranges and at Rose's Gap," *Vict. Nat.*, May, 1921 (xxxviii., p. 4).

shrub, having pale pink flowers, which bears transplanting well, and flourishes in gardens. The "Common Fringe Myrtle," *Calytrix tetragona,* has flowers of much brighter shade of pink, and there were great clumps of the bushes, with an occasional



patch of the "Common Bottle-Brush," *Callistemon rugulosus,* interspersed. The latter made a gorgeous display with its crimson flowers and yellow-tipped stamens against the dark green foliage. Continuing into the sandy country towards

Rose's Gap, we soon sighted Briggs's Bluff towering magnificently above us. Hereabouts the undergrowth was very dense, and the various shrubs had reached a height not often met with in other parts, owing, no doubt, to this locality having escaped bush fires for many years. The "Sallow Acacia," *A. longifolia*, in places twenty feet high, drooped its heavy-laden clusters of dark brown seed-pods. The "Desert Banksia," *B. ornata*, was abundant, and its cone-shaped flower-heads and serrated foliage showed up well among the numerous other shrubs. Among the latter the brown, hairy-covered leaves and flowers of the "Shrubby Velvet-bush," *Lasiopetalum dasyphyllum*, compelled attention. The well-known "Bush Heath Myrtle," *Thryptomene Mitchelliana*, was of extraordinary proportions, and the growth was almost equally luxuriant in many of the following:—"Prickly Grevillea," *G. Aquifolium*, "Yellow Hakea," *H. nodosa*, "Coffee Coprosma," *C. hirtella*, "Giant Hop-Bush," *Dodonæa viscosa*, "Heathy Parrot Pea," *Dillwynia ericifolia*, "Large-leaf Bush Pea," *Pultenæa daphnoides*, "Yellow Rice-Flower," *Pimelea flava*, "Small-leaf Pomaderris," *P. elachophylla*, and "Mountain Conosperm," *Conospermum Mitchellii*. Just as the sun dipped behind the range, leaving a roseate glow which foretold a fine day to follow, we arrived at a prosperous bee farm owned by Mr. Edson, and that hospitable gentleman invited us to spend the night at his residence. We gladly accepted, and, after a hearty meal, spent an enjoyable hour before bedtime listening with interest to the weird bush tales of our host, who has lived so many years in that locality.

Next morning we were early alert, and, after a hearty breakfast, and with many good wishes for our genial host, we started again on our journey. The country was still heathy, and countless varieties of wild-flowers flonrished in the sandy soil, amongst which was that peculiar little plant, *Eriostemon diffoymis*, which has pretty waxy-white flowers and small leaves covered with little oil-bearing knobs. Very graceful was *Bauera rubioides*, with its trailing stems and pale pink flowers, which greatly resembled miniature single roses. Still more beautiful was the interesting liliaceous shrub, *Calectasia cyanea*, whose lovely blue flowers will keep for a considerable time after being gathered. Two more quite worthy of notice were the tufted plant with grassy leaves and pale yellow flowers, *Stypandra cæspitosa*, and the little myrtaceous shrub, *Bæckia diffusa*.

By mid-day we were rounding Mount Zero, and early in the afternoon had reached Rosebrook station, on the Mackenzie Creek. This lovely stream, with its crystal clear water, babbling noisily over its rocky bed and reflecting, with enhanced

beauty, the luxuriant foliage along its banks, might well form the subject of such another poem as Tennyson's "Brook," and brought back to mind the well-known lines, "I chatter, chatter as I flow to join the brimming river." Drooping their graceful heads as though to admire the reflection in the clear water were fine specimens of the "Tassel Cord Rush," *Restio tetraphyllus*, and the "King Fern," *Todea barbata*, besides many others, as Blechnum, Aspidium, Gleichenia, Pteris, Adiantum, Lomaria, Asplenium, and Dicksonia. Above, the stream was almost canopied by overhanging foliage. The "Slender Honey Myrtle," *Melaleuca gibbosa*, and the "Golden Spray," *Viminaria denudata*, intertwined their pink and yellowish blossoms, forming a veritable Eden for the numerous birds which inhabited the bed of the creek. We noticed the Blue Kingfisher, Fantail, Blue Wren, Yellow-breasted Robin, and the introduced Goldfinch.

Nothing botanically interesting was met with in the next few miles, so we spared a little attention to a spot known as "Geranium Springs," where *Pelargonium graveolens* (a garden escape) grew profusely. Many years ago Mr. Carter, the original owner of Rosebrook station, experimented in pig-farming at this spot. It is thought that some of the animals must have escaped, as wild pigs are occasionally met with in the district. The surrounding hills appeared to be ideal collecting ground, so we spent a few hours roaming about. Shrubs and climbing plants displayed their floriferous beauty in entrancing variety. *Correa speciosa*, sometimes known as "Native Fuchsia," usually seen in red or green colouring, here showed in lemon tipped with jade, and the flower stems were very long and slender. Many plants attained a height of ten feet, and, with their slender, graceful growth and uncommon flowers, merited all our admiration. Further on we came upon plants of the better known colours—red and green—on the hills sloping to Mackenzie Creek. The occurrence of so many forms in such close proximity would lead one to suggest a revision of classification, if only in relation to species varieties. Grevilleas, Prostantheras, Olearias, Calytrixes, Hoveas, Acacias, Conospermums, and Brachylomas here vied with each other for pride of place; but their flamboyance did not overwhelm, but rather seemed to enhance, the modest beauty of *Pimelea ligustrina*, with its elegant foliage and pretty, drooping, green-coloured flowers. *Olearia viscosa*, locally known as "Kerosene Bush," on account of its easy ignition, grew profusely. *Kunzea parvifolia*, a beautiful shrub with small, pink, globe-shaped flowers, flourished exceedingly. It has an extended blooming period, and would therefore prove very ornamental in gardens. The "Orange Bell Climber," *Marianthus bignoniaceus*, twined itself

artistically among the Acacias, and near by were some splendid specimens of its congener, *Billardiera scandens*, laden with cylindrical fruits of livid colouring. This area proved a happy hunting ground ; we were able to add to our vasculums *Phebalium pungens, Pseudanthus ovalifolius, Grevillea parviflora, Phyllota pleurandroides, Olearia ciliata, Dillwynia hispida, Brachyloma ericoides, Prostanthera debilis, Leucopogon ericoides, Conospermum patens, Sphærolobium daviesioides, Bossiæa riparia, Templetonia Muelleri, Correa Lawrenciana, C. æmula, Dodonæa boronifolia, Hovea heterophylla*, and *Acacia Mitchelli*; also the following, not previously recorded by us for the Grampians :— *Cryptandra leucophracta, Xanthosia dissecta, Senecio Cunninghamii, Pultenæa tenuifolia*, var. *mollis, Millolia tenuifolia, Stuartina Muelleri, Mitrasacme paradoxa, Spyridium subochreatum, Grevillea ilicifolia*, var. *angustiloba, Leucopogon rufus, Brachycome collina, Prostanthera spinosa, Logania linifolia, Olearia teretifolia, Lomandra leucocephala*, and *Acacia rupicola*.

All the country passed on the way to Brim Springs and Cherrypool showed stretches of the "Curly Chaff Rush," *Lepidobolus drapetocoleus*, and of "Porcupine Grass," *Triodia irritans*, and most conspicuous among the other grasses were the "Nigger Heads," *Pappophorum nigricans*, "Bearded Heads," *Amphipogon strictus*, and "Swamp Wallaby Grass," *Amphibromus nervosus*. We were now many miles from habitation, and with the falling night shades we turned our tired horses towards an unoccupied house by the roadside, where we decided to camp for the night. Surrounded by a neat picket fence, enclosing what had once been a well-kept garden, where long, rank grass now grew as high as the fence, it had evidently been long unoccupied. We put the horses in the garden, where they relished the grass, and rested in security after the strain of a fifty-mile day, while we had some supper, spread our blankets on the floor, and slept soundly.

Next morning we decided to give the horses a spell, and went on foot to examine the northern end of the Victoria Range. Crossing the lower country on the way, we discovered a grass-tree not previously collected ; it proved to be *Xanthorrhœa hastilis*, a new record for the north-west of Victoria. It attains a height of eight feet, and can be readily recognized by the dense rusty tomentum covering the ends of the bracts and outer perianth segments, which is very conspicuous before the flowers expand. This grass-tree was in bloom, and the massed flower-covered spikes emitted a strong odour and also yielded abundant quantities of nectar, which caused the vicinity to be infested with numerous hymenopterous insects. Climbing the range, we came upon the "Coast Rice-

Flower," *Pimelea elachantha*, a plant we had not previously collected. It is a low, rigid shrub, with slender branches, and minute yellow flowers in small sessile heads. We also observed a very luxuriant form of *Spyridium parvifolium*, var. *hirsutissimum*, with very hairy leaves, fully an inch long, and cymes loose and many-headed. We were now doing some stiff climbing, and as we passed along the rock crevices were covered with flowers of glowing colours, quite comparable to, and almost rivalling, the famous flower-decked terraces on the slopes of Mount William. In evidence were *Gompholobium minus* (red), *Hibbertia acicularis* (yellow), *Prostanthera denticulata* (purple), *Leptospermum lanigerum*, var. *grandifolium* (white), and *Stypandra glauca* (blue). Helichrysums, or Everlastings, were innumerable, *H. Baxteri* being the most abundant. Two Grevilleas, *G. oleoides* and *G. alpina*, grew luxuriantly. The former is a handsome shrub with olive-green leaves, having a soft silk down underneath, and it bears red blossoms, while the latter has linear-elliptical leaves with revolute margins beset with velvety tomentum on the under side; its racemes of flowers have a corolla of deep orange to red. We greatly admired the pretty four-petalled blossoms of *Tetratheca ciliata*. It is often erroneously called "Wild Boronia," but it belongs to the Tremandraceæ or Milkwort family. The lovely colours of the "Rough Mint Bush," *Prostanthera denticulata*, shading from pink to purple, blended beautifully with the starry white blossoms of the "Grampian Fringe Myrtle," *Calytrix Sullivani*, which is peculiar to these parts, and here grew to a height of eight feet. Being late in the season, orchids were mostly in seed, but a few still flowered in the sheltered sandstone crevices, which they resembled so closely in colouring that they were difficult to find; We were, however, successful in collecting three, as follows:—*Thelymitra carnea*, *T. Macmillani*, and *Caleana major*. The latter were exceptionally fine specimens, some bearing four flower-heads.

The summit of this mountain rises in steep perpendicular cliffs, which we were unable to climb, so we continued along the slopes for some distance, and were able to add several others we had not previously collected—viz., *Pterostylis rufa*, *Prasophyllum fimbriatum*, *Spiranthes australis*, *Calochilus campestre*, and *Caladenia cordiformis*. The mountain sides exhibit many interesting rock-formations, one group consisting of several chambers supported by pillars and connected by natural passages in the rock. Through the openings magnificent views of the Dundas and Black Ranges could be seen. Just after leaving the chambers we discovered that beautiful little shrub, "Rosemary Grevillea," *G. rosmarinifolia*, covered with pretty rose-coloured flowers. The "Narrow-leaf Trymalium," *Try-*

malium Daltoni, was seen here also, but its blooming period had passed. Proceeding, we passed through a large area of "Southern Grass-tree," *Xanthorrhœa australis*, in full bloom, some of the flower-spikes rising to a height of twelve feet.

Reaching flat country again, swamp-frequenting plants abounded, such as *Sprengelia incarnata, Pultenæa Luehmanni, Xyris gracilis, Epacris obtusifolia, Melaleuca squamea, Viminaria denudata, Sphærolobium vimineum, Grevillea parviflora, Pultenæa laxiflora, Veronica Derwentia*, and *Patersonia longiscapa*—the latter being particularly numerous and beautiful. It is, however, of such a fugacious nature that one's admiration must be limited to viewing it unpicked. It was late afternoon before we reached camp after this strenuous walk, so we prepared a late luncheon and started onward again. The marshes were a glorious medley of myrtaceous plants, and the perfumes of Honey Myrtle, Bottle-brush, and Tea-tree wafted to us on the spring breeze were delightful. After crossing the Glenelg River we soon reached the Horsham to Hamilton road, on which we made rapid progress through Glenisla East, and passed the Lambruk Bee Farm, arriving towards evening at Woolphur station, which is about fifteen miles from Cavendish. Here we received a most hospitable welcome from Mr. Silcock, the owner of "Woolphur," and stayed the night. A very good class of sheep are raised on this estate, and very valuable red gum timber grows on the flat country about the district. Passing through the paddocks, we were surprised to see an old man kangaroo grazing contentedly with the horses. We learned later that he was a much-valued pet belonging to Miss Silcock.

Our progress at this stage was held up for half a day by heavy rain, but we spent an interesting morning acquiring a knowledge of the locality from our host, who has lived forty years there. Towards noon the clouds dispersed, and we started again in the direction of Dunkeld. After passing the settlement known as Victoria Lagoon, we decided to follow the bush track, which would take us nearer the ranges, and were soon deep in a labyrinth of heathy country, where, as usual, wild-flowers abounded, prominent among which were the beautiful mazarine flowers of the "Spreading Flax Lily," *Dianella revoluta*, and the gorgeous red and yellow of the "Parrot Peas," *Dillwynia hispida* and *D. floribunda*. *Leptospermum myrsinoides* showed fine, large, peach-blossom-like flowers, and *Bursaria spinosa* pure white flowers; the latter plant is rather a distinct variety, growing only about two feet high. *Boronia polygalifolia*, with delicately-perfumed flowers of white and very pale pink, abounded. Here the three grass-trees recorded for Victoria were seen together; they are *Xanthorrhœa australis, X. minor,*

and *X. hastilis*, the latter being the one we had observed for the first time near the northern end of Victoria Range. It appears to confine itself to the flat country between the Black and the Victoria Ranges. There was much to attract our attention as we passed slowly through this scrubby country, and we noted the following in full bloom :—*Conospermum Mitchellii*, *Lhotzkya genetylloides*, *Leucopogon virgatus*, *Acrotricha ledifolia*, *Stackhousia viminea*, *Pimelea curviflora*, *Euphrasia collina*, *Brachyloma daphnoides*, *Correa æmula*, and *Cryptandra amara* ; the latter is a thorny, sub-erect shrub, which bears a profusion of small, white, bell-shaped flowers. "Victoria Park," the estate of Mr. Alexander Robertson, lies at the extreme end of Victoria Range, and here we spent our next night. After an enjoyable evening we slept soundly till awakened by the clanging of the cook's bell, which announced breakfast. We next decided to examine the hills around about, but our tour proved very uninteresting botanically ; but, had our subject been zoology, it would certainly have proved more interesting, for wild animals were very numerous. We saw wallaby, foxes, hares, kangaroos, and rabbits innumerable. Birds also commanded attention, and our list of feathered friends ran into scores.

Leaving Victoria Park, we crossed through marshy ground in the direction of Mounts Sturgeon and Abrupt. The lagoons revealed a wealth of water-loving plants, such as *Myriophyllum variifolium*, *M. elatinoides*, *Potamogeton natans*, *Triglochin procera*, *T. striata*, and *Ranunculus aquatilis*. Near the margins the principal plants were *Cyperus lucidus*, *Villarsia reniformis*, *Phragmites communis*, *Cotula coronopifolia*, *Gratiola peruviana*, and *Glyceria fluitans* ; the latter is one of the best fodder grasses for damp localities. It often grows two feet high, and its seeds are sweet and palatable, being eaten by fish and all graminivorous birds. There is fine fertile country around Dunkeld, and the crops were well forward in the paddocks. We noted that some crops of oats were badly infested by caterpillar, which, unfortunately, is much in evidence at this season. Two weeds flourished in the grazing paddocks. They were the "Blue Eryngo," *Eryngium rostratum*, and "Chicory," *Cichorium intybus*. Both were in bloom, and their pretty blue flowers were distinctly attractive. The former is a native member of the Umbelliferæ, often called "Blue Devil." It has a perennial root stock, and is hard to eradicate. The latter is a well-known perennial belonging to the Compositæ. When growing wild it spreads rapidly, but loses its value as a surrogate for coffee.

Before reaching the township of Dunkeld we had to pass through forest country in the gap between Mounts Sturgeon

and Abrupt. The hillsides were masses of yellow blooms. There were *Acacia Mitchelli, Goodia lotifolia, Dillwynia floribunda, Pultenæa humilis, P. Gunnii, Hibbertia stricta, H. densiflora, Gompholobium Huegelii,* and *Platylobium obtusangulum,* while in many places a delightful contrast was introduced by the trailing blue flowers of the pretty "Love Creeper," *Comesperma volubile,* which festooned itself on all the bracken fern and undergrowth, upon which it depends for support.

We had now crossed the saddle, and, after passing the Wannon River, entered the prettily-situated township. Our attention was soon attracted to a monument of Major Mitchell, who was supposed to have ascended Mount Abrupt when he traversed the district in 1836. A twenty-mile run from here took us through the Yarram estate to Watgania, where we stayed at "Lakeview," the home of Mr. Slattery, which overlooks Lake Muirhead.

Mistaking the road delayed us greatly on our way to Moyston next day. This once thriving goldfields township is now but a mere village. Working onward towards Hall's Gap, we passed the Pomonal orchards *en route,* and arrived back at our starting-point about 7.30 that evening. This six days' tour completed a circuit of 182 miles, averaging about thirty miles per day. From a botanical point of view, however, we were not altogether satisfied, the roads being, in many places, too far from the ranges to permit of our making an examination in the time available. We would have liked to go over the Dundas and Black Ranges and other outlying hills, where, doubtless, many forms of interesting flora are yet to be found.

The trip proved very enjoyable. For the scenery alone it was well worth the journey. We viewed scenes of rugged grandeur on the mountain ranges, and on the lower stretches red gum forests of great age; peaceful cultivated valleys, with their orchards, smiling wheat-fields, and cosy homesteads; noisy, babbling mountain streams, and broad, lazy rivers. Everywhere the local people treated us most hospitably, which greatly added to the enjoyment.

For the plan accompanying this paper I am indebted to Mr. A. D. Hardy, of the Forests Department. Though on a rather small scale, readers should be able to follow the routes I have taken in my several Grampian trips.

THE AUSTRALIAN MUSEUM MAGAZINE.—The sixth number, for October, 1922, of this journal is to hand. It contains an excellent series of illustrated articles on various phases of natural history written in a popular manner so as to engage the attention of the ordinary reader, and is a very good shillingsworth.

BOOK NOTICE.

AUSTRALIAN NATURE STUDIES. By J. A. Leach, D.Sc., C.M.B.O.U., Organizing Inspector of Nature Study and Senior Inspector of Schools, Victoria. 512 pp. ($8\frac{3}{4}$ x $5\frac{1}{2}$), with six plates in colour and 2,000 black-and-white drawings. Melbourne: Critchley Parker, 1922. Price 12s. 6d.

NEARLY twelve years ago we had the pleasure of reviewing in these columns the author's well-known volume, "An Australian Bird Book," which has stood the test of time and become a household necessity amongst bird-lovers. The present volume is perhaps more ambitious, covering the whole range of animal and vegetable life, besides a dozen chapters under the heading of "General Studies," in which the effects of the physical forces of Nature are pointed out. "Australian Nature Studies" is primarily a book written by a teacher for teachers, but that does not lessen its value to the ordinary nature-lover, who, however, must not expect to find in it a "text-book" in the usual acceptation of the term. Dr. Leach's effort has been mainly to draw attention to the methods of life in various groups of the animal and vegetable kingdoms. The chapters are written in simple, terse language, every point being illustrated in the line drawings, which are particularly numerous. The colour plates are perfect representations of six of our prominent Australian birds—viz., Crimson Parrot, Blue Wren, Golden Bower-bird, Yellow-banded Parrot, Shrike-Robin, and Blue-faced Finch. The work is well indexed, but this is rather difficult to use, there not being sufficient difference between the type of figures used for text and illustrations; again, the volume is paged at the bottom of the pages—an awkward place for a book where the index will be so much in use—while the numbering of the figures is poor. In an appendix the author points out the value of nature study both in the school and home, and for the benefit of teachers a table of "suggested topics" has been drawn up, covering an eight years' course of graduated steps for children from five to thirteen years of age. Dr. Leach is to be congratulated on the completion of his great task, which, we feel sure, will be appreciated by a very large number of teachers and others, not only in Victoria, but throughout Australia. It clears up a great many points on which there was no readily available literature, and by its simple language and absence of technical terms should do a great deal in advancing the love of Nature, in its many phases always around us in our daily life.

CHARLES J. GABRIEL
BEQUEST
Rec'd 29 Aug. 1963

VOL. XXXIX.—No. 8. DECEMBER, 1922.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

Published 7th December, 1922.

Hon. Editor: F. G. A. BARNARD, Esq

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
FIELD NATURALISTS' CLUB OF VICTORIA	97
THE LATE MR. JOSEPH GABRIEL	101
SOME AUTUMN ORCHIDS. BY (MRS.) E. COLEMAN ..	103
NOTES	102, 108

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Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 11th DECEMBER, 1922.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Miss M. Gwen Evans, Y.W.C.A., Russell Street, City.	Mr. C. Oke.	Mr. C. Daly, B.A.
Miss — Hart,	Mr. J. A. Kershaw, F.E.S.	Mr. C. Oke.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to the Hon. Secretary.

4. General Business.

   Nomination for Member of Committee in place of late Mr. J. Gabriel.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

   1. By Mr. A. D. Hardy, F.L.S.—"Notes on the Measurement of Trees."
   2. By Dr. G. M'Callum—"Common Salt: its Manufacture and Relation to Animal Life."
   3. By Mr. F. Chapman, A.L.S.—"On a Cast of a Sea Urchin from the Red Sands of Studley Park, Kew."

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICES.

The hon. treasurer will be pleased to receive as early as possible all unpaid subscriptions for the current year.

Members whose residences are near the boundaries of the New Postal Districts should forward the number of their postal district to the hon. secretary in order to ensure prompt delivery of the *Naturalist*.

The Victorian Naturalist.

Vol. XXXIX.—No. 8. DECEMBER 7, 1922. No. 468.

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 13th November, 1922.

The president, Mr. C. Daley, F.L.S., occupied the chair, and about sixty members and visitors were present.

A report of the excursion to the You Yangs on Saturday, 14th October, was given by the leader, Mr. C. Daley, F.L.S., who said that the party had a pleasant walk from Little River to the range. As usual, the country was somewhat dry. The characteristic shrub of the district, *Prostanthera nivea*, Snowy Prostanthera, was almost at its best, while the perfume of *Acacia decurrens*, var. *mollis*, filled the air. The view from Station Peak was almost perfect in every direction.

A report of the excursion to Ringwood on Saturday, 21st October, was given by the leader, Mr. C. Oke, who said that a party of fourteen met at Ringwood station. It was decided to take a northerly direction, towards "Pinemont." Though planned for entomology, many of the excursionists were quite as interested in plants, and soon secured trophies in the shape of fine spikes of *Conospermum ericinum*. Just before reaching the creek several species of orchids were met with, among them being *Thelymitra carnea*, *T. longifolia*, and *Caladenia carnea*, and along the creek bank, amongst the undergrowth, *Chiloglottis Gunnii* was found in fair numbers. With the exception of ants, insects were scarce but of these interesting little creatures several species were numerous, and some time was spent in examining their nests. The nests of *Aphanægaster longiceps* were very numerous, and, as the ants were mating, no difficulty was experienced in obtaining specimens of males, females, and workers, the differences between which were pointed out. A nest of *Ectatomma aciculatum* (?) was carefully examined for *inquilines*, and two species of Pselapidæ were obtained, as also specimens of a blind Rodwayei. The afternoon turned out warm, and several preferred to take advantage of available shade to searching for natural history specimens, while orchid-hunting claimed the attention of most of the others. Altogether, fifteen species were obtained during the afternoon, some beautiful spikes of *Thelymitra ixioides* being among those gathered. By careful search on the ground several small beetles were secured, the best of which was *Rybaxis longipilotus*, Wilson (MS.)

A report of the excursion to Yarra Junction on Saturday, 28th October, was given by the leader, Mr. F. G. A. Barnard,

who said that, favoured by a beautiful day, the members who went so far afield (forty miles) enjoyed the outing thoroughly. Many attractive flowers were seen along the railway line, while the colour of the gum-tips was in many instances very brilliant. On arrival at Yarra Junction it was decided to transfer to the steam tram which goes to Powelltown (11 miles), but, as time would not permit of the whole journey, to go as far as Three Bridges (seven miles) and walk back to the starting place. This proved a very good plan, as flowers of many kinds were plentiful. Our first find, on the bank of the Little Yarra, was *Oxylobium ellipticum*, one of our handsomest flowering shrubs, the flowers of which last well in water. Its flowering season was nearly over, but enough remained to indicate what a fine show it makes when in bloom. Walking back along the tram-line, numerous flowering shrubs were noted, such as *Grevillea alpina*, *Eriostemon correifolius*, *Bauera rubioides*, *Pultenæa Muelleri*, *Billardiera scandens*, *Dampiera stricta*, and *Zieria Smithii*. Presently, following the main road, a patch of *Epacris impressa* was found to be in splendid order, with *Dillwynia ericifolia* and *D. corymbosa* making a brilliant show. Altogether, the locality should be productive of a large variety of flowering plants if thoroughly searched.

A report of the excursion to Frankston on Saturday, 4th November, was forwarded by the leader, Mr. J. G. Mann, who reported a good attendance of members and an interesting outing. The Purple Orchid, *Diuris punctata*, was found in fair quantity near the Langwarrin station. A visit was paid to the Frankston golf links, where a large variety of Australian trees and shrubs have been planted for decorative purposes, the majority of which are doing well. The ramble was then directed towards the coast south of Frankston and the beach road followed back to the station.

A report of the excursion to Pakenham on Tuesday, 7th November (Cup Day), was forwarded by the leader, Mr. F. Wisewould, who reported a good attendance and a very enjoyable day. Owing to the late season, flowers of many kinds were still numerous, and the country was looking at its best. Rambles were taken in a couple of directions from Pakenham Upper, where the leader entertained the party at his country cottage.

ELECTION OF MEMBERS.

On a ballot being taken, Miss W. G. Graham, Spring-street, Melbourne; Mr. E. J. Ingram, 133 Barkly-street, North Fitzroy; Mr. R. T. Patton, Botanical Department, University; and Dr. S. F. Ridley, 1 Blyth-street, Brunswick, were duly elected as ordinary members; Miss Helen D. Elder, "Karuc-a-ruc," Rokewood, and Mr. L. D. Cameron, "Coonara," 34 Prince

Albert-road, Mosman, N.S.W., as country members; and Mr. Ernest H. Thiele, Victoria-street, Doncaster, as an associate member of the Club. Miss Graham, being present, was heartily welcomed, especially from the fact that she is a visitor from Canada who is staying for some time in the State.

GENERAL BUSINESS.

The president announced that since last meeting the Club had lost another of its members in the person of Mr. Alexander Borthwick, of Longueville, Sydney, a country member of the Club, and moved that a letter of sympathy be forwarded to his relatives. The motion was carried in silence, all standing.

Mr. F. G. A. Barnard said that a few days before he had received a letter from Mr. C. D'Alton, a member of the Club, residing near Hall's Gap, Grampians, calling attention to the fact that an area of land, locally known as the "Wild-Flower Garden," was about to be thrown open for selection and urging that the Club shoud take action and endeavour to have the area permanently reserved from settlement. He moved that representations be made by deputation to the Minister for Lands asking for the permanent reservation of the blocks in question. This was seconded by Mr. E. E. Pescott, F.L.S., supported by Mr. G. Coghill and others, and carried unanimously.

Mr. A. E. Keep asked what was the position with regard to the export of Australian birds, and read an advertisement appearing in the *Sunraysia Daily* in which a dealer offers to buy any number of Major Mitchell Cockatoos and Shell Parrots. Mr. J. A. Kershaw, F.E.S., said that as the result of the recent deputation to the Minister of Customs a list of birds which may be exported had been drawn up and submitted to various authorities for approval. This would shortly be placed before interested societies, and if agreed to would be gazetted. Both the birds mentioned would be in the protected list.

Mr. H. B. Williamson, F.L.S., said that considerable disappointment was being experienced by plant-lovers at the non-appearance of the long-promised "List of Vernacular Names for Victorian Plants." He moved—"That the committee of the Club be asked to take steps to at once carry into effect the purpose for which the Plant Names Committee was appointed—namely, to publish a 'List of Vernacular Names of Victorian Plants,' and to add such information, not descriptive, as will enable the list to be used in conjunction with Mueller's 'Key.'"

This was seconded by Mr. G. Coghill, and carried unanimously.

PAPER READ.

By Dr. W. Macgillivray, entitled "A Trip to the North and North-West of Broken Hill (N.S.W.)"

The author gave a most interesting account of a trip made by motor-car in the spring of 1921, covering several hundreds of miles, on the borders of New South Wales, Queensland, and South Australia. The principal birds and plants met with were mentioned, and the paper created a very different impression in the minds of many of those present than had previously existed, for a district which had been regarded as almost desert was shown to be, in a favourable season, a veritable flower-garden, while bird-life, particularly parrots and cockatoos, was abundant.

Messrs. E. E. Pescott, F.L.S., H. B. Williamson, F.L.S., and F. G. A. Barnard expressed their appreciation of the paper.

EXHIBITS.

By Mr. A. N. Burns.—A large series of butterflies, with pupa cases in some instances, also Hymenoptera (wasps, &c.), collected near Ballina, Richmond River, N.S.W., Brisbane and Palmwoods, Queensland, during October, 1922.

By Mrs. E. Coleman.—Sections of roots of Native Cherry-tree, *Exocarpos cupressiformis*, showing attachment and root of a eucalypt, ? parasitism; orchids, *Caladenia congesta* and a Diuris, apparently a hybrid, from Bayswater; jaws of a Port Jackson shark.

By Mr. P. C. Morrison.—Species of recent (Echinocardium, sp.) and fossil (Lovenia) sea urchins, from Cheltenham.

By Mr. C. Oke.—Insects from Pakenham excursion, including a rare beetle, *Myrmecholeva acutifrons*, Lea, from the nest of the Greenhead Ant, *Ectatomma metallicum*.

By Mr. A. E. Rodda.—The barbed spine of a Stingray, from Brighton Beach.

By Mr. A. L. Scott.—Pitchstone and associated rock, from Mount Ngongataka, near Rotorua, N.Z.

By Mr. A. J. Tadgell.—*Prasophyllum fuscum*, Tawny Leek Orchid, from near Braybrook; the colour of the plant was yellowish-green, as often found in South Australia (Dr. Rogers); an unusual locality for this orchid. *Caladenia dilatata*, Spider Orchid; colour of flower, canary yellow; an unusual colour for this orchid; found at Woori Yallock, November, 1922. *Tradescantia fluminensis*, Vel., Water Spiderwort, on waste ground at Sandringham, October, 1922; first record as a garden escape; *Echium plantagineum*, Patterson's Curse, dwarf form, from Mitcham and Ringwood; *Gentiana saxosa*, Mountain Gentian, and *Brachycome stricta*, Erect Daisy, shady places from Croydon towards Warrandyte: rare plants near Melbourne.

By Mr. L. Thorn.—Larva, pupa, and imago of a large Mistletoe Butterfly, *Ogyris zozine*, from One-Tree Hill (Mount Cootha), Brisbane, Queensland; forty-five species of butterflies and

sixty species of moths from Ballina, Richmond River, N.S.W., and Blackall Ranges, Queensland, October, 1922.

By Mr. H. B. Williamson, F.L.S.—Orchid, *Diuris punctata*, Lilac Diuris, from Dandenong; *Melaleuca Wilsoni*, *Bæckea behrii*, and *Loudonia behrii*, from Nhill. All these flowers had kept fresh in water for a fortnight.

By Mr. F. E. Wilson.—Tiger Beetles, *Megacephala australis*, Chand., from Pink Lakes, North-West Victoria.

After the usual conversazione the meeting terminated.

THE LATE MR. JOSEPH GABRIEL.

It will come as a great shock to a great many members of the Field Naturalists' Club to learn that one of the "fathers" of the Club, and one of its best-known members, Mr. Joseph Gabriel, entered his long rest on 24th November at the ripe age of 75 years. He had not been himself for the past twelve months, but only his intimate friends were aware of the seriousness of his illness. He was almost a foundation member of the Club, having been elected in July, 1883. He became associated with the committee in July, 1895, and for more than twenty-five years held office, being on many occasions elected at the head of the poll, thus showing the esteem in which he was held by the members. During his presidentship, 1920–21, the Club celebrated its fortieth anniversary. He took part in two of the memorable trips of the Club to the islands of Bass Strait, made about thirty years ago—viz., the Kent Group in November, 1890, and the Furneaux Group in November, 1893; and, loving the sea and its surroundings, he made a further trip to Albatross Island, a tiny speck in the ocean off the north-west point of Tasmania, in company with the late Mr. H. P. C. Ashworth, in October, 1895 (*Vict. Nat.*, April, 1896, xiii., p. 3). He was a pharmaceutical chemist by profession, but his hobbies were many. He was an excellent cabinetmaker, and constructed much of his own furniture, cabinets for specimens, &c., besides building a small yacht at his own home. His natural history tastes were also many. He was a good ornithologist, and had a fine collection of eggs. His love for the sea led him to take up dredging for seaweeds and polyzoa, especially in Western Port Bay, the waters of which became his play-ground for many years, and of which he knew every inch. The shells incidentally obtained during these trips he handed over to his son, Mr. Charles J. Gabriel, also a well-known member of the Club, who in course of time became a recognized authority on the marine conchology of Victoria, and whose collection of the shells of the world is very

extensive, in a great measure the result of exchanges made for shells dredged by his father in Western Port. Mr. Gabriel contributed several papers to the Club's proceedings, more especially regarding the nesting and life of the Mutton-birds at Phillip Island. In his more active days he acted as leader of several dredging excursions in Hobson's Bay, and was ever willing to give advice on that and kindred subjects to inquiring enthusiasts—in fact, he was one of those men who never could do enough to help his fellow-men, no matter what the help sought. When, during the war period, the Club entered into the project of larger wild-flower exhibitions, he was always to the fore in planning details and seeing that tables, &c., were ready long before other helpers arrived at the hall. To him the Club is indebted for the actual making of tables, &c., his latest donation in that way being the reading stand used at the monthly meetings. In fact, he was so generous with his time and talents that it almost became a stereotyped phrase—"Oh, leave it to Gabriel; he will fix it up!" His attendance was most regular at the monthly meetings of the Club, and he was, at the time of his death, a member of the committee. To his widow and family is extended the whole-hearted sympathy of the members of the Club in their loss, which, it will be seen from these notes, is no light one. His remains were borne to their last resting-place in the Boroondara Cemetery, Kew, on Monday morning, the 27th ult., in the presence of a representative gathering of fellow-members and friends

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The Late Mr. A. Borthwick.—It is with regret we record the death of Mr. Alexander Borthwick, of Longueville, Sydney, who was elected a member of the Club in May, 1917. Mr. Borthwick was an old Victorian, who had removed to Sydney for business reasons. He had been a member of the Club in its earlier years, when he was a keen ornithologist. Latterly we believe he had been taking some interest in fish and kindred forms of life.

Exhibition of Wild-Flowers.—It is expected that the Children's Hospital will receive nearly £75 as its share of the net proceeds of the recent exhibition of wild-flowers. In connection with the report of the exhibition in the last *Naturalist*, the names of Mr. C. French, jun., and Mr. E. E. Pescott, F.L.S., were inadvertently omitted when giving credit to the contributors to the orchid table.

Personal.—Members will be pleased to learn that a fellow-member, Mr. C. L. Plumridge, has been appointed Curator of the Parks and Reserves of the City of Kew.

SOME AUTUMN ORCHIDS.

By (Mrs.) E. Coleman.

(*Read before the Field Naturalists' Club of Victoria*, 11*th Sept.*, 1922.)

"Autumn is here—like Spring returned to us,
Won from her girlishness."—Browning,

Surely there is no more fascinating hobby than the study of orchids, and there are two delightful ways of pursuing it: where expense is no object one may tread the primrose path by means of glass houses; but to know the real charm of orchid-collecting one must be a lover of the open and walk the forest ways in search of them.

With me the love of these shy blooms is not an isolated attachment. It is closely associated with the songs of birds, the scent of heath, blue hills, cool gullies, and the whip-bird's call, and the many other delights which each season brings.

To the true lover of orchids there is no "orchid season." To him it is ever "the time of tender opening things," and, though his prizes now are small and insignificant in comparison with ones to be found later,

"When the fields catch flower,
And the underwood is green,"

they are not less beautiful in his eyes. He smiles when he hears the "off season" mentioned, for that is the time when his hope is highest. He continues his rambles through autumn and winter, climbing hills and searching gullies in the sure expectation that he will one day find an orchid new to him—perhaps new to science! This is the one thing he would add to Hazlitt's sum of a perfect day. Who would grudge him his moment of exultation? And is there any finer time for walking than the autumn, when Nature speaks to us of so many rememberable things? We may walk the forest ways for many days without capturing our blue bird; but we shall surely garner a little of Nature's gold by the wayside.

It is surprising how soon one acquires the "orchid eye," and one needs it now, for many of our autumn forms are so small as to escape the notice of all but ardent seekers. In colouring, too, they are very subdued, in strong contrast with the "flaunting flowers our gardens yield" at this time of the year; but, seen under the magnifying glass, their beauty would convert the most indifferent observer into an enthusiast. Let us, then, set out on our autumn rambles, hugging a great "Perhaps."

Although orchids bloom more strictly in accordance with Nature's time-table than many wild-flowers, let us ignore her calendar and agree, as Wilde said when asked his advice con-

cerning the arrangement of some Japanese fans, that "they should not be arranged; they should occur." Having decided to commence our autumn season when we will, our "firstlin' o' the year" shall be the sweetly-scented *Eriochilus autumnalis.* This is to be found on almost any uncultivated lands. This was the first bright orchid we had seen for some time, and it was cheering to meet again a member of the more conspicuous families. Commencing as early as the middle of February, its season extended into the middle of June. April, however, was its best month, and we found it then in large numbers, pushing its way through the driest and most formidable-looking soil "as effortless as woodland nooks send violets up and paint them blue." At the time of flowering the leaf of this little orchid is a mere sheathing bract at the base of the flower-stem. It gradually matures, and in less than three months is similar in size and shape to the full-grown leaf of *Caladenia Menziesii.* Sometimes the withered flower may still be attached to the root to help in identification, but usually it has died off, and one is rather puzzled by these leaves, especially as they are frequently to be found in pairs, suggesting an orchid of the twin-leaved series.

The month of May brought its one-time sister, *Leptoceras fimbriata,* with its fringed labellum, horn-like petals, and autumn shades of green, yellow, and reddish-brown. The leaf, green above with red veinings, is reddish below, and, like that of *Eriochilus autumnalis,* it, too, matures after flowering time. We frequently found this plant with two fully-grown leaves, though in those cases there were no flowers. In no instance did we find two leaves when the flower was present.

The beginning of March saw our first prizes of the tiny Prasophyllum family. These call for unlimited devotion and patience in identifying. To the unseeing eye they are small and insignificant. Certainly "radiance and odour" are not their dower; but under the magnifying glass they are among the glories of the orchid world. With us at Blackburn *P. Archeri* comes first, followed soon by *P. fimbriatum* and more rarely by *P. intricatum.* The labella of these three are all more or less fringed, and tremble prettily in the sunshine. In the first two the dorsal sepal and lateral petals are also ciliated. Roughly, we may look for tiny reddish-brown flowers, though they vary considerably in colour, from yellowish-reddish (to quote Baron von Mueller) to dull or dark red or reddish-purple.

I might remark here that some people have such baffling ideas of colour that I am forced to the conclusion that people may actually *see* colour differently. We found many of these small orchids all through March and April, and a few "last roses" were noted at the end of May.

March also brought two other tiny members of this family —*P. despectans* and *P. brachystachyum*. The petals and sepals of these are not fringed, and each has a long, narrow labellum, which also is not fringed. Thus, though they are quite easily confused with each other, they are readily distinguished from the former group. The labellum of *P. despectans*, however, is pointed, and the appendages to its column are falcate, while the labellum of *P. brachystachyum* is blunt and the appendages of the column distinctly bifid. On a stem from three to nine inches high these carry as many as twenty-five reddish-green flowers, all crowded within the space of an inch at the top. Some other species, *Dixoni*, *fusco-viride*, *nigricans*, *ciliatum*, and *rufum*, we missed this season.

We now come to the Pterostylis family. *P. parviflora* is one of the smallest of the Greenhoods. Being only a few inches high, it is not easily seen, and one is amazed to find the "tiny horns of miraculous green" pushing up through the driest and poorest soil, though the better class land produces more robust specimens. The basal leaves are sometimes present at flowering time. We did not find blooms until early in April, though flower-stalks were showing by the middle of March. There are two quite distinct varieties of this species. The earlier and more robust form carries as many as ten flowers, and is quite frequently more red than green. It has fruited by the time the later variety is well established. This is smaller, has only one, two, or three flowers usually, and is consistently all green.

Some of the most graceful of the Greenhoods occur during the months of April, May, and June, and we now come to a group having stem leaves only at the time of flowering. By the beginning of March at Ferntree Gully we found *P. obtusa* on the stony hillsides it loves, and it lingered until 16th June. May brought the somewhat similar *P. præcox*, and June its robust brother, *P. præcox*, var. *robusta*. Though *P. obtusa* and *P. præcox* are outwardly similar, one notes at once the blunt labellum of *P. obtusa* and the sharp-pointed one of *P. præcox*. Then we notice that the lower sepals of *P. obtusa*, before elongating into its characteristic "points," protrude in a decided "nose." The striæ of *P. præcox* are very clearly defined, and vary from dark green to grey, and often red.

April brought specimens of *P. reflexa* from Maldon. I have not found this near Melbourne, and should be interested to learn of anyone having done so. Broadly, it is a larger edition of *P. præcox* with the "beaky" hood of *P. obtusa*, and it, too, possesses a "sharp tongue." Its close relation, *P. revoluta*, another autumn prize, was found at Ashburton in May. This may be said to be a sturdy copy of *P. falcata*. It has a long,

narrow, strap-like labellum, without the point of *P. reflexa*, and its flowers are considerably larger. The beautiful *P. grandiflora*, with its club-pointed labellum, did not fall to our lot this season, but we were compensated for this by finding the rather rare *P. vittata* at Black Rock in May, although the blooms were poor by comparison with specimens received from Point Lonsdale. Like *P. longifolia*, this orchid has only stem leaves at the time of flowering. The colour of its flowers varies from grey-green, purplish-green, to vivid red, and, as an instance of how little the colour of an orchid may sometimes count in determining the species, I may mention that some all-yellow flowers and one all-green specimen were found this season. The extremely sensitive labellum was chloroformed into submission to the photographer's art.

The month of May brought buds of *P. longifolia*, though this is one of our late winter and early spring treasures. This month, too, came two small members of the Pterostylis family which have basal rosettes of small leaves at the time of flowering. There is no mistaking the bifid tongue of *P. concinna*. By the middle of June this was numerous in many places. A few blooms of *P. pedaloglossa* were found at Black Rock in April, and later we noted many more. This quaint little orchid, with its tailed sepals, has a short, blunt labellum. Leaves and buds of *P. curta* and *P. nutans* appeared by the middle of May, and fine blooms of the latter were gathered at Mount Eliza on 10th June. However, one swallow does not make a summer, and this orchid best loves the month of August. In May also the neat rosettes of *P. barbata* were numerous at Ringwood and Sandringham, though we must wait until late August and early September for blooms of this "Greenbeard." As early as April we noted many well-advanced leaves of *Cryptostylis longifolia*, one of our hot-weather beauties, and during May we saw hundreds of fine leaves of *Lyperanthus nigricans*. We are chary of counting the chickens of this orchid, as we have so frequently been very disappointed in the small number of blooms seen among large areas of leaves, and have gathered some really fine blooms where we found only isolated leaves. Leaves and buds of *P. nana* were also found this month.

Those who love the country should spend some time in Healesville during the autumn. The waysides are then famous for the russet and golden tints of the brambles, and one follows with keenest delight the colour gradation, when the poplars stand like golden spires in their green beds, the willow "trails its amber," and the winds—for which, alas! Healesville is also famous—are for a time stilled. Then

> "O'er my windless soft autumnal weather
> The peace that passes understanding broods,"

In addition to these pleasures, each week is certain to bring grist to the mill of the orchid-lover.

In April we found many leaves and buds of *Acianthus exsertus*, and they were blooming freely early in May. We may expect to find blooms of this until the close of July. Several all-green forms were collected—even the under side of the leaf being green—another instance of many colour vagaries.

The third week in April brought a delightful member of the twin-leaved group—*Chiloglottis dyphylla*, the Autumn Bird-Orchid. Its rich claret and green-coloured flowers are not quite so bird-like as those of its hot-weather relations, *C. Gunnii* and *C. Muelleri*; but it is a really beautiful little orchid, and its development from bud to fully-opened flower is full of surprises. It loves the cool mountainous districts, where it is at its best during the month of May and early part of June. At a Canterbury flower show, held on the 6th September last year, we exhibited a plant which had been blooming for five weeks. This orchid I find to be a shy bloomer in Healesville. In quite large patches of leaves one may only find one bloom —rarely more. I conclude, therefore, that it multiplies below ground rather than by means of seed.

In early April we found leaves and buds of one of the quaintest of the helmet orchids—*Corysanthes bicalcarata*—and by June they were quite numerous among decayed leaves and twigs. They look like a host of reddish-grey slugs, each resting on its single green leaf, which is red on the under side. The hollow spurs are its most salient feature.

The end of May brought buds of *Corysanthes unguiculata* in similar situations. These will be numerous all through July, and those flowers which, with the shelter Nature provides in the shape of fallen logs, dense undergrowth, &c., escape the frosts of July will last until the middle of August. The leaf of this small orchid is also reddish on the under side, and its embryo spurs are plainly visible. Fine blooms of *C. fimbriata* were found at Mount Eliza on 10th June, but Healesville flowers are considerably later. The red and white flowers of this species are almost transparent, and its labellum is deeply fimbriated. Its leaf is grey-green on the under side, not red, as in *C. bicalcarata* and *C. unguiculata*.

Buds of *C. pruinosa* are showing now. The flowers of this are red all over, not streaked, as in *C. fimbriata*. The hood is smaller and more erect, besides being transparent. The flower-stem is shorter—indeed, the flower rests on the leaf. The labellum is only slightly fimbriated, and its edge is curled in, forming a cup. August is its best month, but it will last until the hot winds dry its delicate flowers. Our Healesville specimens do not, however, wholly conform to all the characters

accepted by some botanists as pertaining to *P. pruinosa.* Though I have frequently seen seeded flowers of Corysanthes, in some instances on stalks which have grown to eight or nine inches, these are few in comparison with the numerous cases in which the flower dies and remains a mere blob on the leaf. As in the case of *Chiloglottis dyphylla,* this points to a method of reproduction by the increase of tubers rather than with the aid of seed.

This virtually completes a rather elastic list of autumn orchids, for I have included buds of some winter and spring species. There are some which I have not collected—among them a few which appear to be very local. There are doubtless also new species to locate. I should be unhappy to know there were not, for, after all, "to travel hopefully is a better thing than to arrive." By July our winter orchids are with us, coming not as single spies but in battalions. Indeed, we have only travelled a little way along the orchid road. Perhaps you are disappointed—the flowers may not be so brilliant as you expected; but do not be discouraged in your search. Wait until winter creeps "aged from the earth," and spring's first breath blows "soft from the moist hills," and you shall find others quite as beautiful as the curled darlings of a suburban garden.

AUSTRALIAN ABORIGINAL FOLK LORE.—The vast shoals of mullet which swarm, northerly, up the east coast of Australia in the autumn and winter, as if in search of warmer waters, and pour into every bay and river as well, are well known. Strange to say, the aboriginals found out centuries ago that many weeks before a real good mullet season, in June, the Blue Mountain Parrot, in March, is also unusually plentiful. This parrot has about as much apparent connection with the mullet fish as Tenterden Steeple has with the Goodwin Sands. Yet the omen never fails, for scanty parrots are followed inevitably by scarce fish; similarly the Black Magpie, Crow-Shrike, or the Butcher-bird is the sign for the blackfish; if no "churwung," then no "dimgala"—if plentiful the one, then plentiful the other. If the tailor fish is to be in full supply, then the wattle tree must be in extra full bloom beforehand; if the blossoms be scanty, this fish will be conspicuous by its absence for that season. The Crow-Shrike in May heralds the bream in June. These rules are rigid, hard and fast, and for seven years at a stretch, sometimes, the absence of the one fully guarantees the absence of the other. And, hey! presto! the next season gives us a return of both, in plenty, but always concurrent, and never divorced. —From "Opals and Agates," by N. Bartley, 1892.

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The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

Published 11th January, 1923.

Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	109
Excursion to Frankston	113
Excursion to Pakenham	114
An Entomologist in the Dandenongs in Winter. By Chas. Oke	116
Notes	112, 115, 126

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1923.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 15th JANUARY, 1923.

1. Correspondence and Reports.

2. Election of Members.

As Country Member—	Proposer.	Seconder.
Mr. Harold B. Daley, c/o Dalgety & Co., Albury.	Mr. C. Daley, F.L.S.	Mr. H. B. Williamson, F.L.S.

3. Nominations for Membership.

4. General Business.

The Committee recommends that Mr. Charles French, one of the founders of the Club, be elected an hon. member, in recognition of his valuable services to the Club in its earlier years.

5 Remarks by Exhibitors relative to their Specimens.

Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

1. By Mr. F. Chapman, A.L.S.—"On a Cast of a Sea Urchin from the Red Sands of Studley Park, Kew."
2. Holiday experiences by members.

Note.—It is particularly desired that members who had the opportunity of collecting or observing in country districts during the recent holidays will give brief notes on their experiences.

7. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICES.

The hon. treasurer will be pleased to receive as early as possible all unpaid subscriptions for the current year.

Members whose residences are near the boundaries of the New Postal Districts should forward the number of their postal district to the hon. secretary in order to ensure prompt delivery of the *Naturalist*.

The Victorian Naturalist.

Vol. XXXIX.—No. 9. JANUARY 11, 1923. No. 469.

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 11th December, 1922.

The president, Mr. C. Daley, B.A., F.L.S., occupied the chair, and about sixty members and visitors were present.

The chairman referred to the death, since last meeting, of Mr. Joseph Gabriel, one of the oldest members of the Club, and one who always had the interest of the Club at heart. He endorsed the words of the notice in the current *Naturalist* regarding Mr. Gabriel, and moved a motion of sympathy with his relatives, which was carried in silence, all standing.

Mr. G. Coghill moved—"That a minute recording the late Mr. Gabriel's services to the Club be drawn up and inserted in the minutes of the meeting." The motion was seconded by Miss Bage, supported by Messrs. J. L. Robertson, F. Pitcher, J. H. Harvey, and G. A. Keartland, and carried unanimously.

[The following minute has been drawn up and inserted in the minutes of the meeting: "That this meeting of members of the Field Naturalists' Club of Victoria desires to place on record its appreciation of the many valuable services rendered, both as an office-bearer and an ordinary member, by the late Mr. Joseph Gabriel during his long membership of the Club, in which he exhibited an unselfish interest in its work and a deep love of natural history."]

CORRESPONDENCE.

From Miss Gabriel, expressing the thanks of her mother and family for the letter of sympathy in their bereavement forwarded by the committee at its last meeting.

REPORTS.

A report of the excursion to Nar Nar Goon on Saturday, 18th November, was forwarded by the leader, Mr. J. W. Audas, F.L.S., who reported that, owing to the favourable weather, flowers were fairly abundant, some eighty species being noted in bloom, many of them in considerable quantities. In places *Baueria rubioides* and *Dampiera stricta* and *Lobelia gibbosa* made pleasing contrasts of colour. The simple white flowers of Woolly Tea-tree, *Leptospermum lanigerum*, were much admired, and many other shrubs added to the blaze of colour.

A report of the excursion for pond-life on Saturday, 25th November, was given by the leader, Mr. J. Stickland, who said that, owing to the ponds in the Fitzroy Gardens not being in

good condition, the locality of the excursion had been altered to the Botanical Gardens, with excellent results. The members, who were joined by several members of the Microscopical Society, were fortunate in finding a number of uncommon and interesting forms in the material collected. Several specimens of a Hydrozoon, Cordilophera, sp., were among the captures. This genus, unlike its near relative, the common Hydra, occurs in colonies instead of being solitary, and differs mainly in having more numerous tentacles irregularly distributed over the whole body in place of being arranged in a circle around the hypostome. A beautiful representative of the Heliozoa, *Clathrulina elegans*, was found, in unusually good condition and in great numbers. The Porifera was represented by a fresh-water sponge, probably a species of Spongilla, and the Polyzoa by a Plumatella. Many species of Protozoa and Rotifera, with several algæ, were also noted.

A report of the excursion to Panton's Gap, *via* Healesville, on Saturday, 2nd December, was given by the leader, Mr. F. Pitcher, who said that the party drove out on the Don road for about four miles and then ascended the range to Malleson's Look-out, a climb of nearly 2,000 feet. From this position one of the finest panoramas near Melbourne is laid out before the tourist. The road was then followed to the top of the range, where a sign indicated the turn off to Ben Cairn and Donna Buang. This track was followed for about a mile and a half, but, seeing no indication of the promised fern gullies at the head of the Don River, the members returned by the way they had come and took the track to the Badger or Coranderrk Weir. Here they found a delightful mass of greenery, consisting of tree-ferns and shrubs of many kinds, though containing nothing of special rarity. During the day many wild-flowers, especially of blue and purple hues, were noted. Though the day turned out somewhat warm, none regretted the time spent amid the tree-covered hills of the district.

ELECTION OF MEMBERS.

On a ballot being taken, Miss M. Gwen Evans, Y.W.C.A. Rooms, Russell-street, Melbourne, and Miss E. Hart, "Fassifern," Barkly-street, St. Kilda, were duly elected members of the Club.

GENERAL BUSINESS.

The chairman said it was necessary to elect some member to fill the place of the late Mr. J. Gabriel on the committee. He desired, as a compliment to their late member, to nominate his son, Mr. Charles J. Gabriel, who, he hoped, would accept the position, for the vacancy. This was seconded by Mr. F. G. A. Barnard, and carried unanimously.

The hon. treasurer, Mr. F. Pitcher, read a statement of accounts of the recent exhibition of wild-flowers, which showed a credit balance of £152. Half of this (£76) had, in accordance with the previous determination, been forwarded to the Children's Hospital as a donation to its funds. He read an acknowledgment of the donation from the hospital, and an invitation to nominate three persons as life-members of the hospital in recognition of the Club's effort. It was resolved that the names of Messrs. C. Daley, F. Pitcher, and F. G. A. Barnard be submitted for life-membership.

The chairman expressed the pleasure of the members at seeing their fellow-member, Mr. G. A. Keartland, among them again after a long and serious illness. Mr. Keartland, in thanking the meeting for its good wishes, spoke of the comradeship he had found among the members, and specially referred to the good-heartedness of the late Mr. Gabriel.

PAPERS READ.

1. By Mr. A. D. Hardy, F.R.M.S., entitled "Notes on the Measurement of Trees."

The author said that his paper had been prompted by a letter from an American correspondent, who asked his opinion regarding certain heights of eucalypts quoted in a recent American publication. He had to confess that many of the heights announced years ago for our tallest eucalypts were doubtful, owing to the fact that the method of measurement was not given in conjunction with the record. He contended that the theodolite and steel tape was the surest plan, and, by means of blackboard drawings, pointed out the numerous pitfalls which occur when attempting to measure the height of trees in rangy country, where it is often quite impossible to get a proper "sight" of the tree to be measured, and, as the tallest trees are generally found in steep gullies, errors in determination are difficult to guard against.

2. By Dr. G. M'Callum, entitled "Common Salt: its Manufacture and Relation to Animal Life."

The author, in an exhaustive paper, dealt first of all with the many references to salt and its uses in literature from the earliest times, and then gave a description of the process of manufacture from sea-water at the Cheetham salt works, near Geelong, where, contrary to the usual idea that the salt is produced by simple evaporation, it was shown that the production of salt from sea-water is a long process, during which it goes through several stages, the nature of which are at present somewhat difficult to explain scientifically. At one stage the Brine

Shrimp, Parartemia, appears in countless numbers in the partly concentrated liquor, and seems in some way to influence the success of the process.

Some discussion followed, in which Messrs. P. C. Morrison, A D. Hardy, F. Chapman, G. A. Keartland, J. L. Robertson, and F. G. A. Barnard took part, the general opinion being that an investigation of the process from a bacteriological point of view is desirable.

EXHIBITS.

By Mr. C. L. Barrett, C.M.Z.S.—Photograph of a young Major Mitchell Cockatoo, *Cacatua leadbeateri*. This bird has recently been added to the list of birds protected for the whole year in Victoria.

By Mr. F. Pitcher.—Flowering branches of Cotton-bush, *Cassinia aculeata*, with distinctively bright pink flowers, and fruiting twigs of Native Cherry, *Exocarpus cupressiformis*, collected on Panton's Gap excursion.

By Mr. C. Oke.—Pair of Legless Lizards, *Delma Fraseri* (alive), from Natya, in the Northern Mallee, Victoria.

By Mr. A. E. Rodda.—Photographs of several Victorian snakes; shells of edible oysters found alive in Port Phillip Bay, off Brighton.

By Mr. A. L. Scott.—Foliated schist, from Skipper's Gorge, near Queenstown, South Island, New Zealand.

By Mr. L. Thorne.—Larvæ, pupæ, and perfect insects of a common Victorian moth, *Anthela nicothæ*; also empty pupa case and perfect insect of *Papilio macleayanus*—the pupa was taken during the Toolangi excursion on 15th April last, and emerged on 27th November.

By Mr. H. B. Williamson, F.L.S.—Dried specimen of *Helichrysum Gatesii*, Wmson., described in Proc. Roy. Soc. Vict., xxxv. (n.s.), part 1, Dec., 1922, collected by Rev. A. C. F. Gates, M.A., at Lorne, Dec., 1921. This plant is fairly common, and must have been collected before, but confused with other species. Also a number of species of the genus Pultenæa, described in the same publication.

After the usual conversazione the meeting terminated.

CORRECTIONS.—In December *Naturalist*, page 97, in report of Ringwood excursion, line 7, for "*Conospermum*" read "*Comespermum*"; and on page 98, line 20, for "*D. corymbosa*" read "*D. floribunda*."

EXCURSION TO FRANKSTON.

TEN members and friends put in an appearance on the Frankston train on Saturday, the 4th November, but, instead of disembarking at Frankston, they proceeded, by arrangement, to the Langwarrin siding from which to begin the day's walk. Almost immediately, and within the railway enclosure, a prolific crop of the orchid *Diuris punctata* was discovered, and some very fine specimens collected. Through well-wooded, park-like paddocks, in which *Eucalyptus cinerea*, var. *multiflora*, *E. amygdalina*, *E. ovata*, and *E. viminalis* were about equally distributed, the route led us to the Frankston Golf Club's property. Although all the acacias were finished flowering—except the Black Wattle, *A. decurrens*, var. *mollis*, the scent from which greeted us everywhere—the undergrowth was very bright with Leptospermum, Ricinocarpus, *Daviesia latifolia*, Hibbertia (of which were seen the varieties *stricta*, *acicularis*, *fasciculata*, and *densiflora*), *Dillwynia floribunda*, *D. cinerascens*, and *D. normalis*. The committee of the golf club, entrusted with the beautification of the course, has restricted its operations entirely to Australian flora, and some thousands of trees and shrubs from all parts of Australia have been raised from seed and planted out upon the links. Of eucalypts we saw some fine young growths of the following :—*Robusta*, *alpina*, *botryoides*, *diversicolor*, *dives*, *calophylla*, *tetragona*, *tetraptera*, *Risdoni*, *megacarpa*, *fastigata*, *globulus*, var. *St. John*, *sideroxylon*, *torquata*, *macrocarpa*, and others. Some young Murray Pines, *Callitris robusta*, made a fine contrast in colour with a row of *Acacia podalyriæfolia*, and a few well-grown young *Casuarina Fraseriana* and *C. Huegellii* added to the variety. Luncheon was partaken of in a shady part of the course, where a bush of Geraldton Wax-flower, *Chamælaucium uncinatum*, was in good bloom. After refreshment a walk of a mile—the ladies said a very long mile !—through heathy country and sandy rises brought us to the Sweetwater Creek, near which, in the damp ground, a great number of blue Utricularia, Patersonias, Dianellas, *Thysanotus tuberosus*, Polypompholyx, and *Stylidium graminifolium* were discovered. Here, too, there was much bird-life. The Grey Harmonious Thrush, White-eared Honey-eater, Rufous-breasted Whistler, Yellow-breasted Whistler, Pallid and Fantail Cuckoos, Wood-Swallow, Pardalotes, Black-faced Cuckoo-Shrike, Magpies, and Magpie-Larks were all in evidence. A little further up the creek we came to the large new waterworks for the Mornington Peninsula. This is a fine sheet of water, created by a large dam and earthworks, and supplied by pipes from the creek above Beaconsfield, forty miles away. In some places it must be nearly 100 feet deep. The necessary excavations and quarrying that have been carried on here have revealed

some curious geological formations, in which members of our party were much interested. From this reservoir we then turned westerly for three miles through more undulating heath country, with extensive views over the Bay in front of us, and the intervening country to the Dandenong Ranges behind us, until we came out on the Frankston Heights, at the foot of Oliver's Hill.—J. G. MANN.

EXCURSION TO PAKENHAM.

WITH the leader, who was at Pakenham Upper, Cup Day (7th November, 1922) broke with squalls of wind and drifting rain so heavy that it seemed doubtful whether any members would venture to leave Melbourne to fulfil their promises to take part in the excursion. However, by the time the train arrived (9.15 a.m.) the weather had cleared, and a dozen members met on the platform to greet their host for the day. Vehicles had been provided to cover part of the way to the leader's cottage, which was to be the headquarters for the day. After crossing the old Gippsland road, now known as the Prince's Highway, a fine specimen of *Loranthus pendulus*, fully ten feet in length, was seen growing on a peppermint gum near the roadside. Further on fine bushes of *Daviesia latifolia* in full bloom were seen, also quantities of *Melaleuca squarrosa* and *M. ericifolia* were passed. The Common Broom Tea-tree, *Leptospermum scoparium*, was present everywhere, and its pure white blossoms formed a pleasant contrast with the gayer flowers provided by the thick undergrowth of shrubs and herbaceous plants. On nearing the Deep Creek, about three miles from the station, Bell Minahs were both seen and heard in the valley, where a small swamp was situated. At Deep Creek fine specimens of the Native Cherry, *Exocarpos cupressiformis*, in full fruit were seen, and in the bed and banks of the creek were many fine specimens of Olearia, besides numerous ferns. Here, also, along the creek banks and valley were many fine specimens of Mountain Ash, *Eucalyptus regnans*, towering a hundred feet or more above us. At the spot where the party left the vehicles to walk up the last hill to a further altitude of about 400 feet the roadside provided many fine shrubs of *Pultenæa scabra* and *P. Gunnii*, as well as beautiful plants of *Dampiera stricta*, the colour and size of which were perfection, some of them being between two and three feet high ; the season having been so cool had favoured a more luxuriant growth than usual, while the colouring of the young gum-tops provoked considerable attention. Having reached the cottage, a cup of tea and a scone were partaken of, and a start made for a further walk while the weather, which was then favourable, kept fine. We walked over the hill towards Nar Nar Goon for about two miles, and

on the way the beautiful star-like flowers of *Clematis aristata* were gathered, also a number of showy orchids, including *Caladenia Patersoni, C. dilatata, C. carnea, Glossodia major, Diuris sulphurea,* Thelymitra (three sps.), the Flying Duck, *Caleana major,* and two species of Caloehilus. About half-past one a return was made for lunch at the cottage, and, after a short rest, a further stroll through a rough paddock, past a deep fern gully, in the hope of seeing kangaroos or wallabies, which frequent this part, was taken, but in this the party was disappointed, and a return made for an early tea. Many more flowers were seen in the afternoon, and several of the party secured rooted specimens of native plants for growing in their gardens. Our secretary was very energetic in collecting beetles, and secured one or two rare specimens, regarding which he may have something further to say. No rain fell during the day, and the excursion appeared to the leader to be an unqualified success. The view from the hill above the cottage being unique, and, though the weather was dull, was wonderfully extensive, and greatly admired.—F. WISEWOULD.

THE LATE MR. JAMES R. TOVEY.—It is with regret that we record the passing of another member of the Field Naturalists' Club in the person of Mr. J. R. Tovey, chief assistant at the National Herbarium, South Yarra. He was elected a member of the Club in August, 1907, and contributed several papers on botanical subjects to its proceedings. He also acted as hon. secretary during the year 1913–14. His life was devoted to botany. Entering the State service at the age of sixteen, he was appointed as a junior at the Herbarium under the late Baron von Mueller, Government Botanist. Here he applied himself assiduously to his duties, and at the time of his death, after thirty-three years' service, had a very complete knowledge of Australian plants, and, in fact, of those of the whole world, as represented at the Herbarium. In 1907 he collaborated with Prof. A. J. Ewart, late Government Botanist, in the production of a work on the weeds, poisonous plants, and naturalized alien plants of Victoria. He also contributed several papers to the Proceedings of the Royal Society of Victoria. For many years he had been paralyzed, but his brain remained clear, and he preferred to work to the last, being wheeled in his chair to his duties every day by his daughter, who helped him in every way. He practically died in harness on the 30th of December, and on New Year's morning was laid to rest in the Cheltenham Cemetery, which is situated amidst a tract of heath land he had often wandered over in searching for specimens, and where, some years before, he had watched for several seasons an orchid which was eventually named by Professor Ewart as *Pterostylis Toveyana,* in his honour.

AN ENTOMOLOGIST IN THE DANDENONGS IN WINTER.

By CHAS. OKE.

(*Read before the Field Naturalists' Club of Victoria, 11th Sept.*, 1922.)

As so many people, fellow-members included, have expressed surprise at my going out collecting during the winter months, I have thought that a few notes on what is to be seen in the Dandenongs at that time of year may not be out of place. To most people the bush in wet weather is a place to be avoided. They say everything is so horribly wet and depressing, the tracks so muddy, and the hills so slippery, in fact everything is decidedly unpleasant.

How short-sighted is their vision! For to the person who loves the bush it appears otherwise. I do not mean that even the most ardent bush-lover likes to be caught unprepared by a sudden heavy downpour of rain; but even this, if one has only a few miles to go, and can change into dry clothes, is not an experience without its pleasures—pleasures that appeal to our sense of sight and smell; but if one has on a waterproof, strong boots, and old clothes, plenty of enjoyment can be obtained from a shower of rain, be it heavy or light. If it is a fine, misty rain, it gradually envelops everything with a thin film of moisture, which soon forms into large drops, and falls from trees and bushes. The mists seem to cling in patches to the hilltops and to parts of the gullies; or, if there is a breeze blowing, it comes and goes in waves. Should it be a sudden downpour, and you are at the top of one of the gullies, among the tall gums and ferns, your first feeling will be one of disgust at being caught so far from home. But as you listen to the big drops hitting the trees round you, and forcing their way through the leafy canopy overhead, and falling with a crackling sound on the dried leaves, that are so thickly strewn around, your first feeling of fear and disgust gives way to one of pleasure and admiration.

I have been caught in a heavy storm in the Sherbrooke Gully, near the Giant Tree, and came right down the gully to the town, a distance of about 3½ miles, in a heavy rain all the way. Though I did not like the "ducking" I got, this was more than compensated for by the sight of the rain coming down in large drops, gradually making everything sopping wet, till water came trickling down the trees and undergrowth, forming little streamlets, which went rushing down the slopes, by many a devious track, to the creek below; the different smells of damp leaves, mosses, shrubs, and trees mingling together and forming a fragrance unknown elsewhere. Some of the inhabitants of these gullies do not care for the rain, and when rain comes after a dry or a comparatively dry spell,

sundry moths may be seen darting around, looking for a safe, dry spot to shelter in. Beetles which were on the foliage soon disappear, but others, which habitually live in cracks in the ground and other obscure places, now come out and hide under stones, sticks, &c., on the ground, and are more easily caught. Snails, slugs, planarians, and land-leeches soon become more active and evident as the vegetation and ground become thoroughly wet. Should the rain continue, and everything become very wet, numerous Arachnids, Myriapods, and insects run up the trees and take shelter under the loose bark, where they may be very easily captured.

But what I like best is a good rain overnight, with a fine morning following. How fresh and beautiful everything is! Beads of moisture scintillate in the morning sun, making a veritable fairyland of the bush. Spiders' webs stand out and show the beauty of their weaving in a manner not discernible at other times. Such a morning as this is ideal for a brisk walk before starting to collect, and suits the collector who wants small beetles, such as Staphs, Pselaphs, and other interesting small fry, as the rain has brought them out of their little crevices and hiding-places, and they will now be found under stones, logs, dead leaves on the ground, and in mosses and grass tussocks. On such a morning as I have just described I turned over a log on the side of the hill, at Ferntree Gully, and saw a specimen of *Siagonyx Blackbourni*. This is a fairly common black Carab, or ground beetle. It is about three-quarters of an inch long, with a rather narrow prothorax, having a slightly turned up margin, prominent eyes, long antennæ, and striated wing cases. I had caught, on previous occasions, quite a number of this beetle without noticing what I was now going to witness. Seeing something small move near the Siagonyx, I bent down to see what it was, and in doing so alarmed the Siagonyx, which immediately bombarded me. Several species of Carabidæ and Paussidæ do this, but I was not aware that members of this genus did so. The noise it made was almost imperceptible, and I would never have heard it if I had not seen the little puffs of "smoke." Of course, it is only a vapour, and that is why it was so visible in the heavy, damp air. It fired little puffs of acrid vapour the size of a pea, about three inches in a direct line with the body; then they floated up two or three inches, opened out, and disappeared. Of three individuals tried, two fired eight times and one nine times. Whether this is the full capacity of their magazine I do not know, but it would seem probable. On the sides of the hills numerous Arthropods (articulated invertebrates) live, some of which will seldom, if ever, be found in the gullies, while others rarely leave the gullies.

Let us take a walk up one of the hills at Ferntree Gully or Belgrave, and then down through the gully. One of the first objects that will attract the eye are dried eucalypt leaves suspended in spiders' webs. These are the homes of our common leaf-rolling spider, *Araneus wagneri*, Rainb., a pretty little spider, varying very much in colour and markings, but may generally be said to be a mixture of buff and lemon. It is surprising how such a frail-legged little creature as this is can curl up these leaves. It is very common in these hills, or, at least, the females are, but, though I have searched very carefully and examined hundreds of webs and rolls, I have not succeeded in finding the male. Perhaps the females have eaten them all, for spiders have an easy way of settling their matrimonial differences. There is no divorce or judicial separation with them, and, though there is strong evidence of incompatibility on the part of the female, it is probably due to hunger, not temper, as in some other females. The males seem to be more peaceful, and more contented to live and let live. After a brief courtship and a shorter married life, the females eat their consorts. I have several times seen female spiders eating males, and have seen strong evidence, such as *débris* containing a male pedipalp, around the female retreat, that this often takes place, but have never seen any sign of a male eating a female, and doubt if it ever takes place. *Araneus wagneri* seems to have completely taken the place on these hills of *Gastrocantha minax*, the Thorn-backed Spider of the flats around Lower Ferntree Gully and Ringwood. The ordinary form of this latter spider does not seem to be on these hills, though I have taken its black form near the station at Belgrave.

Turn over a log. What a hurry-scurry takes place! Two Staphylinids disappear almost before we have time to see them. One, the first to disappear, was certainly a Conurus. These beetles run very quickly, with an undulating motion, and have a distinctive look about them, even when running, well known to the collector, but difficult to describe. The other was probably either a Quedius or a Philonthus. When collecting Staphs. quickness is essential, and care must be taken, as they are so easily damaged. Crustaceans of the sand-hopper type hop about in all directions, and often prevent one from catching some much-desired little insect. Small white Myriapods are plentiful, but are probably only immature forms. A cockroach rushes along and sticks its head into a hole, and raises the tip of its abdomen as high as possible into the air. It is *Platyzosteri analis*, Sauss., a common cockroach, about an inch in length, black, or nearly black, with a dull reddish margin and a polished surface. If you want to catch him, gently tap him two or three times with a stick. He will

squirt out a water-white fluid, after which it is safe to handle him. I once caught one without taking this precaution, and, on receiving the fluid on my hand, smelt it. I raised the hand to within three or four inches of my nose. Both smell and sensation resembled glacial acetic acid. The inside of both nostrils felt as though they had been burnt, and it made the eyes water. By the time you have caught your cockroach nothing will be left but a few Adeliums. These beetles are so slow that they will remain for some time before leisurely walking off. Having seen what was of interest under your log, please put it back, where it will act as a cover to be turned over on another occasion, and, as so many insects pupate just below the surface under cover like this, it gives them a chance to breed.

It would be as well to turn over a few more logs and find out what lives under them. On turning over logs and stones it is quite a common occurrence to see underneath what looks like a greyish animal, with a multiplicity of legs, rush off. A common name for these creatures is forty-legged scorpions; but as they are not related to scorpions, and only have twenty legs, the name is not at all suitable. They belong to the family Scutigeridæ, of the Myriapoda, in which they are peculiar on account of their faceted eyes, long antennæ, possession of lungs, and a remarkable sense organ under the head. The poison claws are well developed, but whether they are capable of inflicting a really poisonous injection is a moot point. Alive or freshly killed they are very pretty little creatures, of a pale blue-green, with some pink markings, and brown antennæ and feet. What sense is situated in the organ under the head is not known. Other Myriapods that abound under logs are millipedes and centipedes. Millipedes are harmless, inoffensive vegetable feeders, and without poison claws, but generally have well-developed glandulæ odoriferæ — "stink glands." These do not seem to develop any strong smell in the species in these hills. Centipedes are a more numerous class, and show a greater diversity in colour, size, and number of feet. The colours range from blue-green, green, red, brown, yellow, and white. The number of legs differs. The common greens and reds have twenty-one pairs, some of the browns and yellows thirty-eight pairs, while some of the thin, paler ones have as many as seventy-two pairs. These latter ones are very thin, and are only as thick as a bit of knitting silk. One thing that may be of interest is the way they poison. I have heard it asserted that they sting with the appendages on the tail, also that they bite with their mouths. Neither is really correct, as the poison claws are not, strictly speaking, a part of the mouth. Just behind the mouth, on the under surface, is a

transverse plate, having at either end a sharp, curved fang or claw. It is with these that they inject their poison. To a casual observer this plate will appear to be a part of the mouth, especially as on its upper edge it bears two small projections, having a dentated edge, which are used in crushing its food; but it is easily detached, and when removed leaves all the mouth parts exposed.

Spiders are well represented, and members of several families are to be met with, the most numerous kind being Lycosids, or Wolf Spiders, and some large black Dictynids. Phalangids are found under logs, and are mostly of the short-legged type; but these and scorpions, which are also met with, are more numerous in the gullies.

Cockroaches are represented by several species, and their egg-capsules are very common objects. They are well worth a close scrutiny. Cockroaches carry their eggs about with them in the capsules, sometimes till they are ready to hatch. Along its upper edge are a number of serrations; these are probably of use to the insect in holding it, but each serration is the top of an egg. *Panesthia australis*, Brunn., the largest cockroach in this district, is very common under logs and in rotting wood.

Rather a rarity is that peculiar, grotesque-looking, wingless mantis, *Paroxypilus tasmaniensis*, Sauss., which, unlike other mantids, lives under stones and logs.

Beetles belonging to several families are to be found, the greatest number of species belonging to the Carabidæ. One very interesting member of this family is the common *Notonomus phillipsi*, Cast.; this is a black, shining beetle with greenish (sometimes purple) reflections, about three-quarters of an inch long. During the winter they will often be found under logs, and less often under stones, in a little chamber 1½ inches across and half an inch deep. This is their breeding chamber. Do the beetles make it themselves, or do they select some suitable depression? As they are usually so much alike, one would think they must be made by the beetles; but as I have never seen any sign of the dug-out earth having been deposited around, and as the beetles are not provided with any pronounced digging apparatus like that possessed by the Onthophagi and other digging Scarabs, I am inclined to the former view. In this chamber thirty or forty little elongate eggs are deposited. They are almost white at first, but turn to a pale yellow before hatching. The little grubs are white when first hatched, but in a day or two turn yellow, and then gradually into a light brown. On turning back the cover, after the eggs have been laid, and until the grubs have left this nest, the mother will almost invariably be found standing over the eggs or larvæ

(as the case may be), and showing every sign of fear and anxiety for the safety of her offspring. She generally turns round and round or makes little runs backward and forward, and but seldom running away. It would be very interesting to know if the mother feeds the young during the time they remain in the breeding chamber. If so, it must be with regurgitated juices, as I have never found any sign of *débris* in or near this breeding chamber. This, of course, is very unusual in the insect world, as very few insects, with the exception of the social Hymenoptera, ever see their offspring. I do not know how long the grubs remain in the maternal home, but I believe it to be about three weeks after hatching.

Numerous ants have their homes under logs, but the one most frequently met with is *Amblypone australis*, a light brown ant with a sneaky way of walking and a nasty sting. Bull ants, Myrmecia, sps., are also partial to logs. Stones harbour a similar kind of animal life. Some species seem to prefer the stones, others the logs. Few, if any, are absolutely restricted to either. Ants are certainly more numerous under the stones than the logs, and provide an interesting subject for study, as also do their inquilines. As these inquilines are usually so scarce and take so long to find, we will leave them undisturbed to-day, for, though this is the best time of the year to look for them, it needs such careful looking in the nests that we would not see the other interesting items. The commonest ant in these hills is *Ectatomma aciculatum*, Sm., while the ant having the largest colonies is *Aphanagester longiceps*. This ant is not very active during the winter, and seems to keep underground as much as possible. It is a perfectly harmless ant. Not so the Jumping Ant, *Myrmecia pyriformis* (?), which has a most severe sting, and always seems to be seeking a "*casus belli.*" Winter is the only time when it is possible to spend more than a few seconds at a time looking in their nests, as during the cold, wet weather they are not so energetically militant as during the warmer months; but should they get on you they lose no time in bringing their stings into action. One of our larger Staphs., *Xantholinus phœnicopterus*, Er., seems to me to exhibit a queer taste in often pupating in the sides of these nests, which is a place I would not think of tarrying in; yet this beetle could not be called an inquiline, as it is found in a number of situations in no way connected with ants. Under these stones are to be found what are known as vegetable caterpillars, because they resemble little toadstools, having a caterpillar for a root. This is due to a peculiar fungus called Cordyceps. This genus of fungus attacks caterpillars that live in the ground, killing them and then growing out of one end of them. I have found it growing

out of Scarab (Dynastid) grubs, and the Swift Moth caterpillars, Porina (? sp.—probably *fusco-maculata*).

Under the bark of trees many insects and spiders live, and so let us strip off a little from some smooth-barked gums. It is surprising the number of spiders that come tumbling down from some trees. They belong to several families, Drassids, Clubionids, Thomisides, Argiopids, Dictynids, and Attids being very common. Spiders have very few enthusiasts, and yet they are very interesting in their habits, and show such a diversity of structure in their anatomy that to study them properly would prove very interesting. In studying the classification of a spider so much has to be thought of: the number of lung-books, the disposition of the spinnarets, presence or absence of a cribellum, and the number and arrangement of the eyes being the more important items. Numerous Carabs are very common on these trees, as also are some weevils and Tenebrios. Longicorns are very scarce; practically the only one to be taken is *Tessaromma undatum*, Newm., but a nice fresh specimen of this is very pretty. It is about three-quarters of an inch in length, of a pretty cinnamon-brown, with a bluish blush on the shoulders and along the sides, with a pretty design of gold and dark brown markings. Several species of Hymenoptera appear to be hibernating under the bark. Bugs are plentiful, and in every stage of development. One curious species is the Hairy-legged Bug, Ptilocnemus. This bug is half an inch long, and has a tuft of hairs on its hind tibiæ, and on stripping off the piece of bark that shelters one it appears to be very agitated, and keeps on tapping with its hind legs, using alternately its right and left leg: probably its idea is to frighten other insects, which might easily find it an alarming spectacle. Under the loose bark one may often come across a creature of interest. At first glance it resembles a small crab, or a scorpion without a tail. It is an Arachnid, and therefore related to the scorpions. It belongs to the Chernetidæ, and is commonly called a "false scorpion," or Chelifer, after a typical genus. The jar of pulling off the bark generally makes them run under any bit of cover handy, such as, say, a piece of cobweb. Wait a while, and out it comes, very carefully sensing its way by waving its pedipalps in front of it. Having no eyes, it must feel its way carefully, and as it advances it seems to be all on the *qui vive*. It rarely walks straight ahead, but meanders along, pausing frequently, as though to consider what is in the air. Touch the bark just behind it, and away it runs with every sign of hesitancy gone. They nearly always run an inch or two and then turn around to face the danger, and run away backwards. This may be for two reasons, one being that they look more fearsome from the front view, and it allows

them to protect themselves from attack with their pedipalps; the second is that they can run much quicker backwards than forwards. Under the claws, on the ends of the legs, they have a peculiar trumpet-shaped membranous organ. These are spoken of as suckers in text-books, but it is highly probable that they receive sound waves with them. Make the faintest scratch with a piece of grass several inches behind one, and it immediately jumps around to face whence the noise comes, thus proving that they can hear or feel very much finer vibrations than we can. Chelifers do not spin snares for catching their prey, though they are provided with spinning organs. These open out on the digit of the chelicera, and are only used for making a small web at breeding time. The possibilities of bark-stripping, even in winter, are practically inexhaustible, and it is often that small piece which does not look as though it were worth bothering about that harbours some precious little specimen. But it would only tire you were I to go into more detail. Suffice it to say that representatives of every order of insects are to be taken.

In shady nooks, and sometimes out in the open, occur little plots of moss. Bags of this should be taken home for sifting over white paper. Sometimes it will be found to be teeming with animal life. Certainly most of it is small, but none the less interesting for that. Beetles are the most numerous inhabitants of moss, and the families that are most numerously represented are Staphylinidæ, Pselaphidæ, Carabidæ, and Curculionidæ. Some individual species are very common; others you might only come across once in a lifetime.

Having had a look at a few of the small inhabitants on the hills, let us go down into the gully. There is no sharp distinction in the Arthropod fauna, as might have been expected. Certainly a few species live exclusively in the gullies, but their numbers are small, and, as a rule, they exhibit no structural peculiarities to differentiate them from those that live on the hills. It is the dampness that attracts so much life here, and that is why some forms are quite common here and are comparatively scarce on the hills. When hunting down here one cannot fail to notice the remarkable numbers of hopping crustaceans that abound everywhere; under or in cover of any sort they will be found. Many species of Arachnids are common; scorpions, spiders, chelifers, phalangids, and mites are all to be found in numbers. Scorpionidæ is represented by one species only; it is very common, and may often be found, especially in early winter, under a log or stone, covered with its young. The young are a pale cream when first born, and cling to the mother's back; gradually they become mottled with brown, and then leave their mother's care to fend for

themselves. This scorpion is a contradiction to the statement, often seen in books, that they are inhabitants of dry, arid parts, for it is only to be found in damp situations. There are many points of interest that suggest themselves in connection with the biology and bionemics of these little creatures. Two in particular are: What is the function of the pectines, and to what extent are they poisonous? The pectines are situated on the under surface of the second abdominal segment, and are comb-like in appearance. Various suggestions have been made as to their function, but it is probable they are connected with sex, as they are more developed in the male. No doubt it would be easy to ascertain the effect of their sting, but one hesitates to try it. Spiders (Araneæ) are very numerous, both in regard to species and individuals, perhaps the most interesting kind being one about three-quarters of an inch long, and much heavier in build than is usual with the ordinary or true spiders. I have said "true spiders," for, while it certainly is a spider, it has four lung-books, and its chelicera (erroneously called jaws) work up and down. These are the characters of the Avicularidæ, or trap-door spiders. Other spiders have two lung-books, and their chelicera work sideways. This spider is not uncommon amongst rotten wood, but does not, as far as I am aware, have a door to its tunnel. Chelifers (Chernetidæ) are much less common, and few in species; but they are to be found in moss and amongst decaying leaves on the ground. Phalangids are fairly numerous, and at least one species very common. These Arachnids are generally dubbed "spiders," but may easily be distinguished from spiders by the absence of a "waist," there being no constricted pedicle between the cephalothorax and the abdomen. Phalangids also have only two eyes, situated in a little turret-like protuberance on the caput. There is one very curious form that may be found clinging to the "hairy" part of the tree-ferns, the body of which is only one-sixth of an inch in diameter (it is practically a flat circle), with very long legs. The chelicera are chelate, and nearly three-quarters of an inch long. The legs are thin, but slightly swollen at the joints, and at their ends are very thin and prehensile. The length of the four pairs of legs is approximately 1, 2, $1\frac{1}{4}$, and $1\frac{1}{2}$ inches. Altogether, it is a remarkable looking creature.

By far the commonest Phalangid is one that may be found under logs, &c., and in moss. A mature specimen measures under half an inch, and is a dark red-brown, the front appendages being more reddish. The chelicera are heavily built and chelate (formed like the large claws of a crab). The pedipalps are also thick, with a row of teeth on the upper and lower edge of its inner surface for crushing its prey. With the exception

of these appendages the whole upper surface is coriaceous and opaque, and the upper surface beyond the caput is armed with transverse rows of obtuse tubercles. Phalangids are provided with stink glands, and in this species they must be well developed, for their presence is readily detected by their peculiar pungent odour. The only other thing that I know of that smells like them is certain species of Ichneumon flies when they are emerging from their pupæ. These two smells have a great resemblance to one another.

Mites (Acarina) abound everywhere. Their numbers are legion, and a handful of moss or rotting leaves, taken at random, is sure to contain several different species. Brilliant red with white spots is the colour of one of the largest. Others are dull red, brown, yellow, and black, while others are mottled. One of the prettiest is a mixture of red and brown, with white spots.

Centipedes are plentiful, and towards spring will often be found under any sort of cover rolled around their egg-masses. The prevailing large blue-green species lays very pale yellow eggs, while those of the thin yellow species are a pretty heliotrope or mauve colour.

Insects of every order live in these gullies, and may be taken in some stage of their development at this time of the year. Springtails (Collembola) are in every moist spot. On being disturbed they spring in any direction that chance may take them, without regard to whether danger or safety lies that way. What a pity they are so frail! It does not give us much of a chance to examine them properly, or to see how they really spring. It is easy enough to see the spring extended after it has been used, but to see how it is held by its catch, or by what mechanism it is released, is very difficult. Orthoptera are scarce. An earwig or two, three species of crickets, and a few cockroaches are about all. Hymenoptera are better represented. An occasional parasitical fly (Ichneumonidæ, &c.) may be seen. Wasps' mud nests can be obtained for breeding at home; while ants can be obtained in great numbers, with one species, at least,. peculiar to the gullies. Coleoptera are, as usual, the most numerous in species. They are to be found in all kinds of places—in fact, it is almost impossible to imagine a spot where some kind or other will not be found. Lepidoptera are scarce in the winged stage, but a few larvæ and pupæ are to be found. A fair number of Hemiptera (bugs) will be found in moss, under cover on the ground, and under bark. In the latter place one queer little wraith exists; it is long and thin, and when disturbed raises itself up as high as possible on its legs and rocks itself up and down and sideways. It moves slowly at first, then, either gradually or suddenly, quicker and quicker, till it is impossible to follow its movements, no doubt

thereby often frightening its enemies. Diptera (two-winged flies) are fairly plentiful, though mostly small. A few mosquitos (Culicidæ) and "Daddy Long-legs" (Tibulidæ) persist through the winter, as also does a small wingless fly and various other forms.

Now for a short note on a three days' stay at Belgrave on the 1st, 2nd, and 3rd of July, 1921. This was arranged with the idea of collecting beetles, and particularly to try to obtain another specimen of a species of Chlamydopsis, of which I had previously obtained a single specimen. In this I was unsuccessful, but by dint of much searching I obtained three specimens of two species belonging to this genus new to science, and by bringing bags of moss back to the boarding-house, and sitting up till the small hours of the morning, I secured many fine (in more ways than one) beetles. What pleasure it is teasing moss over paper and seeing all sorts of small animal life come tumbling out! What fascinating little things I saw! But time will not permit of mentioning even the barest details now. For the three days I brought home 156 species of beetles. Several others were seen, but passed over as being too common to take, the families supplying the greatest numbers being:—Curculionidæ (34), Carabidæ (32), Staphylinidæ (25), Tenebrionidæ (21), Pselaphidæ (10).

Having given some slight account of what is to be seen in the Dandenongs during the winter, I think you will agree with me that there is plenty to see, and still more to learn about its Arthropods.

"SOME WILD-FLOWERS OF TASMANIA."—The issue of a second edition of a botanical work of this description indicates that some notice must be taken of the native flowers of the island State. The author, Mr. L. Rodway, Government Botanist, has introduced a considerable amount of interesting matter into his descriptive notes, which, while not being too technical, should afford his readers a great deal of the "why and wherefore" regarding the floral organs of the various plants dealt with. Only the more noticeable flowers are described. These are grouped into seventeen chapters, such as "The Rose Family," "Purple Heather, also Blue Love," "Sheoke and Beech," &c. A couple of pages of vernacular names are given. Unfortunately, many are very different to ours for the same plants. The work is illustrated by reproductions of photographs, which in some cases hardly do justice to the subject. Seeing that many Tasmanian flowers, or very closely allied species, occur also in Victoria, flower-lovers in this State should find its 145 pages very useful. It is published by the Government Printer, and costs three shillings and sixpence.

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The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

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Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	127
A Trip to North and North-West from Broken Hill. By Dr. W. Macgillivray	131
Notes	130, 148

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1923.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 12th FEBRUARY, 1923.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Miss Maude M'Lean, 314 Cardigan Street, Carlton.	Miss L. Cruikshank.	Mr. A. J. Tadgell.
Mr. R. B. Paul, Bourke Street, Melbourne.	Mr. F. Chapman, A.L.S.	Mr. J. A. Kershaw, F.E.S

3. Nominations for Membership.

4. General Business.

   The Commitee recommends that, in view of their continuous membership of the Club for more than forty years and their efforts on its behalf, Messrs. W. M. Bale, F. G. A. Barnard, D. Best, J. E. Dixon, F. Pitcher, T. G. Sloane, and F. Wisewould be elected Honorary Life Members of the Club.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

   1. By Mr. A. L. Scott—"Notes of a Geologist in New Zealand." (Illustrated.)
   2. By Mr. C. Oke—"Notes on the Victorian Chlamydopsini (Coleoptera), with Descriptions of New Species."

Note.—It is particularly desired that members who had the opportunity of collecting or observing in country districts during the recent holidays will give brief notes on their experiences.

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

NOTICES.

The hon. treasurer will be pleased to receive as early as possible all unpaid subscriptions for the current year.

Members whose residences are near the boundaries of the New Postal Districts should forward the number of their postal district to the hon. secretary in order to ensure prompt delivery of the *Naturalist*.

The Victorian Naturalist.

Vol. XXXIX.—No. 10. FEBRUARY 8, 1923. No. 470.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 15th January, 1923.

In the absence of the president (Mr. C. Daley, B.A., F.L.S.) through illness, Mr. E. E. Pescott, F.L.S., one of the vice-presidents, occupied the chair, and about fifty members and visitors were present.

The chairman referred to the loss the Club had sustained since the last meeting by the death of Mr. J. R. Tovey. He moved that a letter of sympathy be forwarded to his widow and family. The motion was seconded by Mr. F. G. A. Barnard and supported by Messrs. C. French, jun., H. B. Williamson, F.L.S., A. J. Tadgell, F. Pitcher, and Dr. C. S. Sutton, and carried in silence, all standing.

REPORT.

A report of the excursion to Upwey on Saturday, 16th December, was given by the leader, Mr. C. Oke, who said that a small party left town by the morning train. On arrival at Upwey they investigated the country on the northern side of the line and found many insects and plants to interest them. This portion of the ranges was found to be almost in its primitive state, and contains much of interest to nature-lovers.

ELECTION OF MEMBER.

On a ballot being taken, Mr. Harold Bailey, Albury, N.S.W., was duly elected as a country member.

ELECTION OF HON. MEMBER.

The chairman said that the committee had decided to recommend to the Club that on account of his many services to the Club in its earlier years, Mr. C. French, sen., one of the founders of the Club in 1880, and formerly Government Entomologist, be elected an honorary member of the Club. He had much pleasure in moving to that effect. The motion was seconded by Mr. D. Best, who was co-founder with Mr. French, and supported by Messrs. F. G. A. Barnard and F. Pitcher, two of the few remaining original members, and on being put to the meeting was carried unanimously.

PAPER READ.

By Mr. F. Chapman, A.L.S., F.R.M.S., entitled "On a Cast of a Sea Urchin from the Red Sands of Studley Park, Kew."

The author said that the finding of this cast of a Kalimnan sea urchin, apparently allied to the Lovenia of the Beaumaris

cliffs, conclusively decided the age of the Red Sands to be Lower Pliocene, and belonging to the same series as the Brighton Ironstone beds. The cast was found some years ago, during a University geology excursion, and he was indebted to Professor Skeats, D.Sc., for the opportunity of examining and describing it.

HOLIDAY EXPERIENCES.

In place of a second paper, members were asked to give any experiences during outings taken in the Christmas holidays.

Mr. C. Oke said that he had visited Wright (Emerald line) on Christmas Day, and, though the day was very showery, he had managed to collect a few interesting insects. He had also found a specimen of a Peripatus, a rare Arthropod, found in damp spots under logs, &c., and a live specimen of the large black land snail, *Paraphanta atramentaria*. On New Year's Day he had visited Pakenham, under different conditions, as the day turned out very hot. Here he had found several nests of an interesting ant, *Iridiomyrmex nitidus*, in which several species of minute beetles, which live associated with ants, were taken. One of those taken was *Glymptoma kingi*, a bright reddish-brown Staphylinid, hitherto unrecorded for southern Victoria.

Mr. H. B. Williamson, F.L.S., gave an outline of a trip to the Bogong High Plains *via* Tallangatta, Mitta Mitta, and Glen Wills. He spent two nights on "the top," and with two companions—Mr. Downes and Mr. S. Clinton—traversed "the plains," covering about 30 miles of the country above the 5,000-feet level. Mr. Downes provided horses, including one for the pack. Mr. Clinton, formerly teacher at Mitta Mitta school, who is an enthusiastic mountain rover and plant observer, did the journey (nearly fifty miles) on foot. He reported that many interesting alpine plants were collected, one of which appears to be an undescribed Brachycome, and promised to present a fuller account, illustrated, of the trip at a later date.

Mr. E. E. Pescott, F.L.S., said that he had spent a fortnight at Belgrave, in the Dandenong Ranges, and was quite satisfied that our "hill" country is among the finest in the Commonwealth. The scenery is glorious, and the fern glens and gullies are grand. He went to Sherbrooke Gully and Falls one day. This is the finest piece of nature near to Melbourne, and is well worth visiting over and over again. Here he met a visitor who complained of the rigid regulation that he could not take away two or three ferns. He was told that if every visitor did that there would soon be no Sherbrooke Gully. He saw in a private gully a very fine specimen of the Tasmanian "Leather-wood," *Eucryphia Billardieri*; it was about ten feet

in height, and in full flower, and was one of the finest flowering shrubs he had ever seen. The clusters of dainty white flowers, not unlike plum blossom, were very beautiful. Orchids were scarce. It was rather early for the "Hyacinth" Orchid, *Dipodium punctatum*, but one or two good spikes were found. The "Potato" Orchid, *Gastrodia sesamoides*, was found in one of the gullies, its flowering evidently having been retarded by the secluded position. One fruiting specimen was found, nearly four feet in height, crowned with thirty-nine seed-heads.

Mr. A. Brown said that members who desired to see virgin country, untouched by bush fires, should visit the Latrobe Valley, *via* Noojee, where some of the finest forest scenery in Victoria existed.

NATURAL HISTORY NOTES.

Mr. D. Best said that during a recent walk through the Asylum grounds at Kew he had noticed that the English elms planted along the main drive were being attacked by a well-known wood-boring beetle, *Uracanthus acuta*. This beetle, in its larval state, tunnels the branches of the trees, and finally, when about to complete its larval life, cuts the branches almost off, so that they are easily broken by the wind, and thus seriously disfigures the trees. He thought that the beetle had taken to the elms on account of their natural food tree, the Silver Wattle, having become so scarce.

Mr. F. E. Wilson mentioned that during a recent visit to Bayswater he had found a specimen of the parasitic fungus, Cordyceps, known as the vegetable caterpillar, growing on the larva of a beetle, probably an Elaterid. It was about three-quarters of an inch in length, but he was keeping it in cool and moist conditions to see if it would develop further.

Mr. F. G. A. Barnard said that about eighteen months before he had planted a number of eucalypts and acacias in his garden at Kew. These were now five or six feet high and doing well, but he had found they were not immune to insect attacks. In the spring the leaf-eating larvæ of a small moth had done much damage to the foliage by spinning the young leaves and shoots together, and so disfiguring the trees. Then, during the warm summer evenings they had been visited by quantities of a small brown Scarabid beetle, resembling the ordinary cockchafer, but only about three-quarters of an inch in length. These arrived on the wing all at once just about sunset, and, though not settling on the trees for more than a few seconds at a time, managed to bite the young leaves, serrating the edges and quite spoiling the appearance of the trees. The visitation lasted only about a quarter of an hour, when the beetles departed just as suddenly as they

arrived. At first the gums seemed the favoured food, but latterly two or three of the acacias had proved the attraction.

Several members said they had noticed similar occurrences but to a lesser extent than Mr. Barnard.

Mr. C. Oke said that when collecting recently in the Caulfield district he noticed a number of holes in the ground similar to those made by trap-door spiders. On digging up several of the holes he found them to be inhabited by a lygosid spider, a form which he had never before found occupying such a habitation.

EXHIBITS.

By Mr. F. G. A. Barnard.—Live specimen of the Red-striped (poisonous) Spider, *Latrodectus scelio*, taken at Kew.

By Mr. A. S. Blake.—Blooms of *Eucalyptus macrocarpa*, a native of Western Australia, grown at Ivanhoe. These were very fine, measuring at least three inches across.

By Mr. F. Chapman, A.L.S.—Cast of fossil sea urchin, Lovenia (sp.?), from the Kalimnan Red Sands of Studley Park, Kew; examples of *Lovenia forbesi*, a common Kalimnan sea urchin, from the Beaumaris cliffs; a collection of seaweeds, from Torquay.

By Mrs. Coleman.—Bark of the Lace-bark tree (N.O. Thymeleaceæ) of Jamaica.

By Gelogical Survey of Victoria (per Mr. A. E. Rodda).—Aboriginal scrapers and chippings, from Coward Springs, South Australia.

By Mr. C. Oke.—Insects from Upwey excursion; Lycosid spiders living in tunnels with trap-doors, from Caulfield.

By Mr. F. Pitcher.—Flowering specimens and plants for distribution of *Clematis glycinoides*, D.C., Erect Clematis, grown at South Yarra.

By Mr. A. E. Rodda.—Live Carp fry from Yarra billabongs, East Kew.

By Mr. J. Searle.—Rare rotifer from Queensland, *Trochosphæra æquatorialis*, Semper.

After the usual conversazione the meeting terminated.

A Rare Rotifer.—The rotifer exhibited at the January meeting of the Club was originally found in ditches in the rice-fields of the Philippine Islands, and was named and described as *Trochosphæra æquatorialis* by Professor Semper in 1872. It has a transparent, spherical body, with the principal ciliary wreath round the middle of the sphere. It has since been discovered in Queensland by Mr. W. R. Colledge, of Brisbane, to whom I am indebted for the specimens, and its occurrence described by him in the journal of the Queensland Field Naturalists' Club.—J. Searle.

A TRIP TO NORTH AND NORTH-WEST FROM BROKEN HILL.

By Dr. W. Macgillivray.

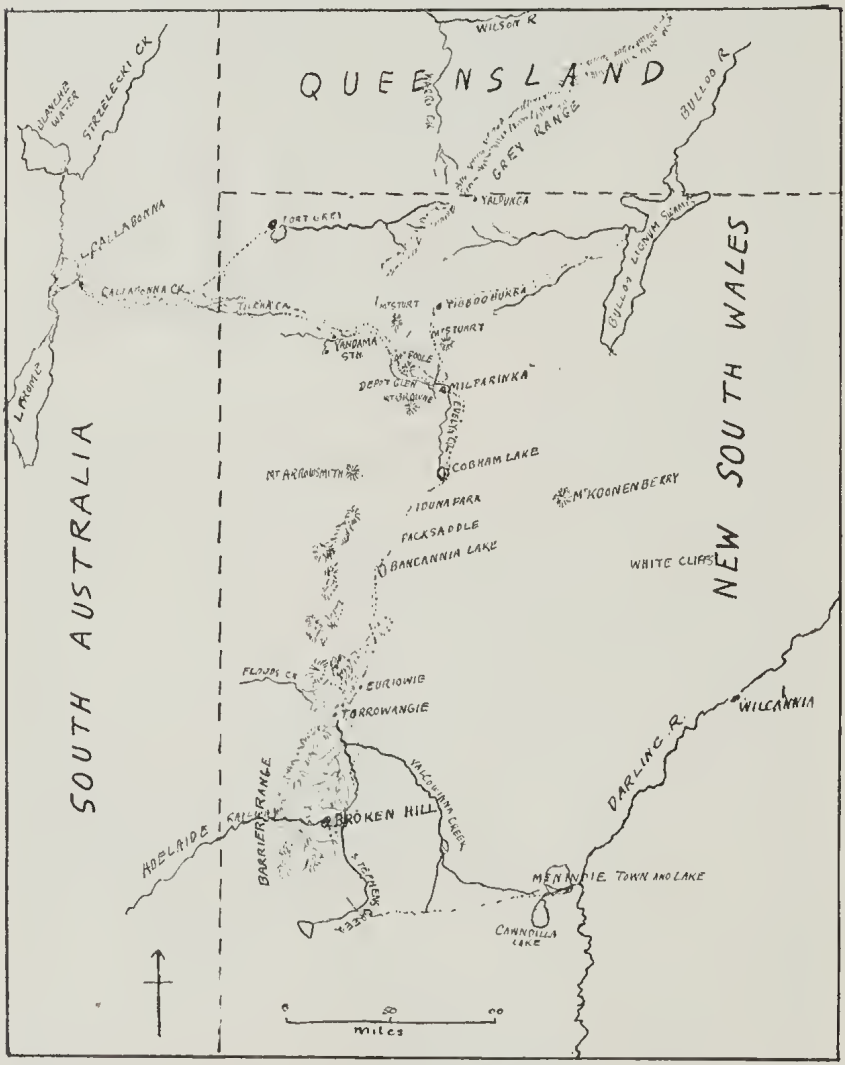
(*Read before the Field Naturalists' Club of Victoria, 13th Nov., 1922.*)

On the 13th August, 1921, Dr. Chenery and I packed our belongings on a Ford trolley and started in the forenoon on the northern road. Two friends, Mr. and Mrs. Heywood, and my son were to follow after lunch in a Dodge car. From Broken Hill the road crosses Stephens Creek, nine miles out, and runs parallel with a tributary stream, bordered—as are all these creeks in the Barrier Range—with Red Gum, *Eucalyptus rostrata*. We pass the ruins of the old Mt. Gipps woolshed, cross a sandy water-course with odd specimens of *Acacia sentis* along its banks, and make our way over a rocky rise, which is quite gay with flowering plants and shrubs—*Eremophila alternifolia*, *Isotoma petræa*, and *Prostanthera striatiflora* —which seem to get all the nourishment that they want from crevices in the rocks.

We pass a point in the sandy water-course marked by a jutting rock where there is a soak, doubtless known of old to the aborigines, and scraped out in time of drought by the Euros, *Macropus robustus* (Kangaroos) and Yellow-footed Rock-Wallabies, *Petrogale xanthopus*, that were at one time plentiful in these ranges. A fine patch of *Acacia Burkitti*, flowering in a valley on our left, attracts our attention soon after crossing the Tarrawingee railway line. Albiontown, now a few ruins, serves to remind us of the silver boom of earlier years. Crossing Yalcowinna Creek, we make our way up a long stony rise, barren at most times, but now gay with white and yellow composites—*Helipterum floribundum*, *H. corymbiflorum*, *H. moschatum*, and *H. polygalifolium*, and occasional purple patches of *Swainsona tephrotrycha*. Soon after passing Thompson's Siding, and ascending on to the stony country again, the purple Swainsona patches become more frequent, but are rivalled by the beautiful brown and yellow *Swainsona phacifolia*. We run parallel with Campbell's Creek for a time, turn to our right near the ruins of an old hostelry, pass through a patch of that curious broom-like shrub, *Templetonia egena*, and enter the Euriowie Hills.

The country here, responding to an unusual rainfall, looked like a garden; even the Dead Finish, *Acacia tetragonophylla*, usually so rugged and forbidding with its spiky phyllodes, was now gaily dressed in yellow fuzzy balls, and had never looked so well for many years. *Helipterum polygalifolium*, with its golden heads, and the crucifer, *Blennodia lasiocarpa*, coloured the hillsides yellow or white, as position or soil favoured one

or the other. Cockatoos, *Cacatua sanguinea* and *C. roseicapilla*, came out of hollows in the gum-trees on every creek that we passed. Proceeding through picturesque hilly country till within a mile or two of Fowler's Gap, we pull off the road on to a creek bank to await the other car. During the hour that



we had to wait we rambled along the creek, which was well tenanted by Bare-eyed Cockatoos, *Cacatua sanguinea*, Rose-breasted Cockatoos, *C. roseicapilla*, Ring-necks, *Barnardius barnardi*, Crested Pigeons, *Ocyphaps lophotes*, and Yellow-throated Miners, *Myzantha flavigula*. After billy tea we go on,

and stay for the night at the Fowler's Gap Hotel, where we were entertained by the landlord's reminiscences till bedtime.

We are up before the grey dawn, and follow the road over gravelly, plain country till we reach Sandy Creek bore, where there is a watering-place for travelling stock. The road has taken us out of the Barrier Range, and the gravel now gives place to sand. The vegetation consists of a few scattered and stunted Mulgas, Kochia bushes, and annual salt-bush, with a few bunches of *Myriocephalus Stuarti*, not yet properly out in bloom, and the usual white patches of *Blennodia lasiocarpa*. Bancannia Lake, 100 miles from Broken Hill, is our next place of call—an open lake with a little box timber, *Eucalyptus bicolor*, at its northern end, and at present only half full.

Resuming our journey, the sand-rises north of the lake show many evidences of aboriginal occupation in the past in the shape of heaps of burnt earth, cooking stones, and scattered pounding or grinding stones and nuclei. The country now becomes more sandy, and supports a goodly growth of Mulga, *Acacia aneura*, with an underscrub of Turpentine, *Eremophila Sturti*, *Eremophila Duttoni*, with a few Hop-bushes (Dodonea). *Myriocephalus Stuarti*, the fine large "Ham and Eggs Daisy," is here more in evidence. Occasional bright yellow patches of *Senecio Gregorii* and the lighter yellow of *Goodenia glauca* tended to brighten the roadside. After passing Packsaddle, an out-station in the scrub, we get into hilly country, passing a few rocky outcrops out on to long, undulating, gravelly plains somewhat bare of vegetation. On one of these stands the Iduna Park Hotel, with a tobacco-bush (*Nicotiana glauca*) creek about half a mile in front, and another about a mile in the rear, bordered by a few scattered red gum and box trees. We push on till we come to the sand-hills that surround Cobham Lake, at present dry, but the sand-hills are covered with vegetation. The grey-green foliage and long racemes of yellow flowers on *Crotalaria dissiliflora* excite our admiration. This is a perennial pea that would well repay cultivation; the bushes grow to about two to three feet in height, and were often utilized as a support by a climbing pea, *Glycine clandestina*, with pretty little bunches of light purple flowers. The Blennodia growing here, *B. canescens*, var. *pterosperma*, was very much finer than that common about Broken Hill. This is a crucifer, very like Candytuft in its inflorescence. *Swainsona tephrotrycha* was in fine large bunches, with heads having as many as twelve to fifteen flowers on each. Many Bennett's Crows, *Corvus bennetti*, were building in the Mulgas, most of the nests being in course of construction.

After leaving the Cobham sand-hills our road ran for most of the way along flats parallel to and on the eastern side of a

well-wooded creek. These flats are subject to inundation, and, at the time of our visit, were supporting a wonderful growth of herbage, mostly salsolaceous and (more conspicuously) flowering plants. *Swainsona procumbens*, the Gilgai Pea, covered acres with a vivid mantle of purple. This is the largest of the Swainsonas, and only comes up and flowers in a good season, when it is usually to be found in crab-holes, or "gilgais," in salt-bush plains, or on flooded flats. We note that a large, bushy Eremophila has added itself to the vegetation near the creek; this is the "Quea Murra" of the blacks, or *Eremophila bignoniæflora* of botanists. A number of stems commonly grow up from a common root stock and spread out fanwise, hence the blackfellows' name, which means fish's hand or fin.

About ten miles and we come to Milparinka. A rocky bluff intrudes itself on the right, and marks another change in the vegetation, as it is the southern limit of the Gidgee, or Stinking Acacia, *A. cambagei*, a fine timber tree, growing larger than any other Acacia in Western New South Wales, many being forty to fifty feet high, with solid trunks two feet in diameter. The wood is exceptionally durable, and takes a fine polish. When a shower of rain falls on the foliage a most disagreeable and sickening odour is given off, and no bushman ever lingers in a Gidgee forest when the trees are in flower, as the scent is equally bad. The approach to the town is along the creek through Red Gums, Gidgee, and *Eucalyptus microtheca*. Milparinka was a prosperous town about thirty years or more ago, when Mount Browne and other gold rushes were being boomed; but the glory has departed from it now that no mines are being worked, and successive droughts and the advent of the rabbit have cut down the stock on the stations to almost the vanishing point.

Here we leave the main road and take one in a westerly direction, which leads us through gibber country for nine miles to Mount Poole station. This homestead is picturesquely situated at the foot of a ridge with a gum creek running below it. It has an historic interest to all Australians, for it was here that Sturt, the greatest of our explorers, and his party were shut in for many months in 1845 by a pitiless drought. A few hundred yards down the creek, on the opposite side to the station, one finds a few old sticks and the ashes of the camp-fires where Sturt yarded his sheep and had his camp. Across a gully a hundred yards further down is an old Beef-wood, *Grevillea striata*, fenced in, and close by stands a concrete obelisk erected thirty-nine years ago by the station hands to mark the site of Poole's grave. On the tree itself is plainly to be seen an oval bare space from which the bark has been removed, and

chiselled into the wood, "J. P., 1845"—Poole's initials and the date of his death. The old tree looks good enough to weather another seventy-five years or more. What changes has that old tree seen since Sturt's time! and for how long before it is impossible to tell. About two miles above this spot is the famous Depot Glen, with its Cathedral Rocks, as depicted by Sturt himself—the only comparatively permanent water-hole in that corner of New South Wales. In Sturt's time, and after, the rare floods that came its way swept it clean and left it full, to last for twelve months or more. Man has tried to improve upon Nature by putting a dam across at its upper part; but, instead of converting it into two permanent holes, the result has been that it is not swept out when the creek floods, and both are silting up, and now only hold a few months' supply.

Behind the Glen is the mount from which the station takes its name, and on its top a cairn of stones put there by Sturt's party. To keep his men from brooding over their enforced imprisonment, Sturt got each man to carry a stone or two up to the top and add it to the pile every day. However, we leave all this for our return journey, and hasten on to Mount Sturt station—our destination for our second night out—where we are hospitably entertained by Mr. and Mrs. Bartlett.

On the following morning, after a delay occasioned by my having to go out to see a soldier settler's wife, who was seriously ill, we push on over undulating gibber country intersected with dry Gidgee water-courses, several of which were examined for bird-life, but birds were scarce both on the gibber and along the creeks, as the recent drought had thinned their ranks. We come to a gum and Gidgee creek, and follow it down to Yandama station, arriving in time for lunch, after which my son and Mr. and Mrs. Heywood go out to the blacks' camp, where there is an Englishwoman married to one of the aborigines, about the ugliest man in the camp. She lives with him in a humpy, and has two sons, whom she hopes to take to England some day. Dr. Chenery and I go down the creek to the wool-shed, where there is a good water-hole. We find Galahs and Bare-eyed Cockatoos, *Cacatua sanguinea*, nesting in nearly every tree, but very few birds other than Crows, *Corvus bennetti*, and Miners, *Myzantha flavigula*.

We were early on the move next morning, taking "Siddown Jimmy" from the camp as our guide. A thirty-seven mile run brought us to the border of South Australia; then another seven and we pull up at Tilcha station for a meal, afterwards pushing on to Tilcha bore, another twenty miles. Here we find hot, slightly alkaline water gushing from a six-inch pipe, an invaluable asset in this dry country, as it runs the Callabonna Creek for about eighteen miles. We are now in the sand-hills,

all running parallel to one another, and this creek finds its way between two of them. It was our intention to push on to Callabonna, but fate ruled otherwise, as the Dodge gets stuck in trying to cross the creek a few miles below the bore, and our energies are occupied till dark in getting it out, so we decide to make camp where we are. The constant supply of water has freshened up all the trees along the creek and brought up many young ones, and it has also made the creek a resort of bird-life. Wedge-tailed Eagles, Whistling and Little Eagles, Black Kites, *Milvus migrans*, Brown Hawks and Kestrels, Crows, *Corvus bennetti*, Miners, Greenies, *Meliphaga penicillata*, and "Willy Wagtails," *Rhipidura leucophrys*, being well represented, Galahs, *Cacatua roseicapilla*, Bare-eyed Cockatoos, *C. sanguinea*, Blue Bonnets, *Psephotus xanthorrhous*, and a few Budgerigars and Cockatiels, but the Many-coloured Parrakeet was conspicuous by its absence. The Striated and Red-lored Pardalotes were in equal numbers. Broken Hill is about the southern and eastern limit of the Red-lored Pardalote. Whitefaces were numerous. Flowers were plentiful, *Senecio Gregorii* and *Helipterum polygalifolium* lining the slopes of the sand-hills and the valleys between them. Along the tops of these hills the Green Sand-hill Pea, *Crotalaria Cunninghami*, and the Yellow, *Crotalaria dissitifolia*, were blooming profusely in company with *Myriocephalus Stuarti*. *Acacia ligulata* was well in flower, and a beautiful object: it is usually a low, squat bush, but varies with locality. The Gidgee disappeared gradually after we left the stony country, and was replaced by *Hakea leucoptera*, which became more and more numerous.

On the following day we follow a track more or less obscure, but cannot go wrong, as the sand-hill walls us in on our left and the creek is on our right. We reach Callabonna station at about 1 p.m. We are anxious to see the deposit of fossil bones, the graveyard of numbers of Diprotodon and other extinct marsupials and birds, from which numbers of specimens had been unearthed twenty-five years previously by the South Australian Museum authorities, from whom I held a permit to view but to touch not; but this we find quite unnecessary, as no local personage seems to know where the deposit is, and drifting sand has covered all trace of former excavations. We have faith, however, in our guides, "Boolka Fred" and "Siddown Jimmy," and they take us along a most atrociously rough track down to a creek that runs into the lake, and then point to an island about two miles away in the vast expanse of white salt. The outlook is desolate in the extreme, the lake being surrounded by sand-dunes, the elevations being held by samphire bushes, with the intervening

spaces wind-swept. The greater part of the lake bed is covered with a saline efflorescence, water intensely blue in the centre. With the exception of a few Orange-fronted Chats, bird-life is absent from the dunes. We tramp out to the island, but find it occupied only by a solitary fox and a few Chats. We return to camp on the creek, and are informed by our sable guides that the bone deposit is probably on the opposite side of the lake. The Common Mallow, *Lavatera plebeia*, which grows so profusely and rankly in many places, they tell us, was one of their principal sources of cordage for making the nets for capturing Emu and Kangaroo. The bark and outer woody layer were stripped off, baked in hot ashes for about an hour, then macerated in water till soft, after which the fine white fibres were separated and twisted into strands. This plant should be of commercial value for its fibre and the ease with which it could be cultivated.

We return next morning to the station, and decide to visit another part of the lake where the bones were most undoubtedly to be found, three guides accompanying us in a waggonette and pair of horses. We follow the Murnpeowie road, which goes north—quite a good road—till we are directed to turn off through a dry, wide blue-bush and cane-grass flat. Crossing this, we disturb several flocks of Grass-Parrots, *Neophema elegans*, that were feeding on the ground under the blue-bush. These flocks consisted mostly of young birds. We go over a very rough rise on which are a few stunted needle-bushes, *Hakea leucoptera*, or "Purrunda" of the natives, and Dead Finish. The Dodge comes to a halt on top, and I wander off amongst the bushes. A few Pigeons, *Ocyphaps lophotes*, White-faces, *Aphelocephala leucopsis*, *Artamus cinereus*, and Short-billed Crows were the only birds recognized. During my absence from the car, two parrots, answering to the description of the Scarlet-chested Grass-Parrot, *Neophema splendida*, came and sat for some minutes on a small Dead Finish within ten yards of the car. They flew off, and, though we searched the locality, neither Dr. Chenery nor myself caught a glimpse of them again. Dr. Chenery followed some Calamanthus in the cane-grass, but was not successful in obtaining a specimen.

Our further search for the fossil bones being without result, we return to the road and follow it to a well, and make camp for the night. From one of the stunted gums not far from our camp we disturb a pair of Spotted Harriers, and find their nest, containing one egg, placed amongst the leaves at the end of a horizontal branch at about 20 feet from the ground. Along the bed of the creek were some fine bushes of *Crotalaria dissitiflora* and *Swainsona tephrotrycha*, and, in places, quite a forest of the Mallow, *Lavatera plebeia*, many of the plants being

ten feet high. The night was a calm one, beautifully mild and moonlit. My son, Ian, and I walked out on to the sand-dunes which surround the lake. These are held together by samphire bushes, with drifting sand between, and before us, stretching away for miles, was the white expanse of Callabonna. Not a sound broke the silence, though we strained our ears to listen. A silence as of the dead brooded over the place ; no mammal or bird stirred or uttered a sound. We could not help thinking it a fitting resting-place for the remains of the giant marsupials and birds who roamed these regions before fertile and well-watered hills and valleys gave place to sand and stones and salt.

On our way back next day, Dr. Chenery and myself left the cars to walk through the flat where we had seen the Grass-Parrakeet, *N. elegans*. We disturbed at intervals Orange-fronted Chats, Wedgebills, and White-winged Wrens. Several flocks of the parrots were again disturbed, and a few Cinnamon Ground-birds, *Cinclosoma cinnamomea*. We tried to obtain specimens of a Calamanthus, but the wily little bird eluded all our attempts, and remained unidentified. My son, Ian, who came back to meet us from where the cars waited, reported having seen a Wedgebill's nest containing one egg in a blue-bush, and flushed a Boobook Owl from its resting-place in the cane-grass. We went back to the station to fill radiators and water bags, and take the back road to Tilcha. Many Black Kites, *Milvus migrans*, were about the station, and a pair of Whitefaces had their nest in the verandah spouting, and were feeding young. Through the flat before us we pick up the bore water, and note many old Hawks' nests, mostly those of Whistling Eagles and Kites. We disturb a pair of Letter-winged Kites, *Elanus scriptus*, from their nesting-tree, and stop our cars to admire the beautiful colouring of these rare birds as they fly round close above us. In the bright sunlight they appeared to be pure white, with a jet-black mark round and behind the eyes, and the broad black stripe down the centre on the underside of each wing forming, with the wings bent, the letter W, which gives the bird its name. The wings are long, and the manner of flight is quite unlike that of any other hawk, and reminded one of the slow, flapping flight of the larger Terns, the wings being raised well above the horizontal before the slow down stroke, a few of these alternating with a sailing flight with widely-outstretched wings, but no separation of pinions. The nest was compactly built of fine sticks lined with fur and leaves, and about a fortnight later contained four eggs.

Crossing the creek where the bore water ends, we follow the oad back along the south bank of the stream, and between it

and the sand-hill which runs parallel to it. The creek is lined with *Eucalyptus microtheca*, Cattle-bush, *Heterodendron oleofolium*, and *Acacia ligulata*. This Acacia and the Needle-bush, *Hakea leucoptera*, are the principal trees on the flat between the creek and sand-hill. The sand-hill is of loose red sand, on which a scanty vegetation grows when the seasons are favourable, as on the occasion of our visit. Besides the two Sand-hill Peas previously mentioned, and the usual Composites, we find here occasional patches of Parakeelyah, *Calandrinia balonnensis*, with its thick, watery leaves and heads of glowing reddish-purple flowers. Birds are numerous along the creek. Galahs and Bare-eyed Cockatoos are occupying all available hollows, and other nesting birds are Miners, *Myzantha flavigula*, Greenies, *Meliphaga penicillata leilavalensis*, "Willie Wagtails," Grallinas, and Nightjars. Short-billed Crows' nests occur every twenty or thirty yards. The Whistling Eagle was the most numerous of the Hawks, then the Black Kite, *Milvus migrans*, with the Little Eagle, *Hieractus pennatus*, third. A Wedge-tailed Eagle flew from its nest in a tree about 500 yards out from the creek, but we did not bother to examine it, and later flushed another from a nest on the creek, which contained a finely-marked pair of eggs. A pair of Grey Falcons, *Falco hypoleucus*, were flushed from a nest about 40 feet up in a gum, but, though complete, it did not contain eggs; the birds, which were of a beautiful light grey colour, sailed round above us. This is the most tractable of our four Falcons when in captivity.

Dr. Chenery and myself had been walking along the creek, and soon after came to where the cars had halted for the night. After an early breakfast we find a nest of the Black Falcon, *F. subniger*, on an old Kite's nest which the Falcon had commandeered for breeding purposes. This contained two downy white chicks, about a week or ten days old. A short walk brings us to where a Grey Falcon is seen sitting on the edge of her nest, about forty feet up in a gum; this contained four fresh eggs. A Little Eagle's nest placed near the top of a fairly thick limb was examined by Dr. Chenery and found to contain a finely-marked pair of eggs. This bird lives mostly upon rabbits, and, seen along the creeks, appears to be a quiet and inoffensive bird; it will, however, kill other birds, and has an evil reputation amongst the rest of the avian population, who are given to mobbing it more than they do any other hawk. A pair of Black Falcons were seen harrying a Whistling Eagle, one chasing it out over the sand-hills; the Eagle, however, returned, and the Falcon renewed the attack, and, finally clinching, and locked together, the two went down in a spiral, screaming as they went, followed by the Falcon's mate, who came down from a higher plane to his mate's rescue.

We pass several Teal on the larger hole on the creek; two pairs were caring for young broods. A bank contained a number of Pardalote holes, the Red-lored and Striated being in equal numbers in the trees. Most of the Brown Hawks were of the lighter type. Of water birds, odd lots of Water-Hens, *Microtribonyx ventralis*, and Black-fronted Dottrel were disturbed at intervals. Before we come to the bore itself we flush another Grey Falcon from a nest high up on a slender limb, and a Little Eagle from her nest not far from the Falcon's.

After leaving the bore our road runs back between the sand-hills for some time, the hills being farther apart, with a scanty scrub of Needle-bush, Mulga, and Dead Finish on the intervening flat. Feeding out from some scrubby patches on the sand-hills, Cinnamon Ground-birds are noted at intervals along our track. On some of the lower sand-rises we come across a fine growth of the Wild Parsnip, *Didiscus glaucifolius*, with its pale mauve flowers. After leaving Tilcha station we go on to a small, dry creek and camp at dark. A Needle-bush near the camp contains nests of the Crested Pigeon and Yellow-tailed Tit, both birds sitting on eggs, and in a near washaway bank a Red-lored Pardalote had her burrow, with a pair of Short-billed Crows feeding their young in a nest about twenty feet up in a gum-tree.

We turn off near a dam, which has been dedicated to England's patron saint, at right angles to our sand-hills, and others that are now ahead of us, our objective being Fort Grey, a spot in the extreme north-west corner of New South Wales, so named by Sturt in 1845 after the then Governor of South Australia, who afterwards became Sir George Grey. This spot was Sturt's base for his final struggle to reach the centre of Australia in a year of exceptional drought and excessive heat—an effort of heroic endeavour which has never been excelled in the annals of Australian exploration. We have now to cross the parallel sand-ridges at frequent intervals. Some give us much exercise in pushing or making corduroy over the loose sand; others we run down to find an easier way over where the slope is more gradual or where a sufficient vegetation binds the sand. The tops of some of the sand-hills support quite a number of flowering plants, the Yellow Pea, *Crotalaria dissitiflora*, being the most conspicuous, with yellow and white composites. Here we see for the first time a trailer, *Indigofera brevidens*, with a violet-blue inflorescence, and quite a luxuriant growth of the climber *Glycine clandestina* supporting itself on the hop-bushes, *Dodonæa viscosa*, var. *attenuata*. On a sand-hill nearer St. George we found a very beautiful Cassia, *C. pleurocarpa*, just coming into flower—trusses of large yellow flowers and pretty, pinnate green leaves; the flowers were very

sweetly scented, and the bushes about three feet high. This shrub dies down to the root in the dry weather and shoots up again after good rains. The two desert lovers, *Eremophila Sturti* and *Eremophila Duttoni*, were fairly common as under-scrub to the Mulga. About ten miles from St. George we halt by a small lake to fill our radiators. This is Lake Stuart, named after M'Douall Stuart, who was with Sturt in these parts and afterwards was the first man to cross the continent from Adelaide to the Northern Territory coast.

A long run brings us to another dam, where the number of scattered bones and skeletons of cattle bear evidence of the severity of the last drought. On some of the sand-hills near here we admire the clumps of White-wood trees, *Atalaya hemiglauca*, with their clean trunks and fine bushy heads. Like many of the trees of this semi-desert land, these clumps are all connected by their root systems. Needle-wood is not so common here as it was near Callabonna. Birds are scarce—a few Cinnamon Ground-birds, Whitefaces, Crows, "Willie Wagtails," Ground-Larks, and occasional Orange-faced Chats. No Parrots in this scrub except Blue-Bonnets and Budgerigars. The former is holding its own in the struggle for existence, and the latter are migratory, and can usually find better feeding-grounds in time of drought, though they will sometimes keep to a drying watering-place till every bush surrounding it shelters heaps of their dead.

The presence of Tea-tree, *Melaleuca trichostachya*, in the vegetation announces the neighbourhood of Fort Grey and its Lake Pinnaroo. We drive round the edge of the lake to the old house, and find no one at home. As darkness has overtaken us we ask our dusky guide for a camping-place near water, and he, not knowing that the lake still contains water, directs us towards its centre, till the leading car sinks in the mud, and the black is not popular during the next two hours of perspiring effort which it takes to get it out. We pass an uncomfortable night, as it is windy and inclined to rain before daylight, forcing us to get up and pack our bedding. We soon hear Galahs and Bare-eyed Cockatoos clamouring on all sides, as they have nesting-hollows in all suitable trees round the lake. Budgerigars are also prospecting dead trees and stumps for hollows small enough for their purpose. A few Blue-bonnets come to inspect us, and a nestful of young Magpies are calling for their early morning feed.

Dr. Chenery, Ian, and myself leave our friends to rest whilst we set out to walk round the lake and get an idea of the birds in the wide margin of box-trees, outside of which is a scrub, consisting mostly of tea-tree. As we cross the dried marginal area we cannot help remarking the sweetly-scented atmosphere,

due, we find, to a small crucifer, *Blennodia nasturtioides*, which carpets the ground. Many Hawks' nests are in the bordering box-trees, but few occupied. A Little Eagle is flushed from one of these, and a few yards on we disturb a Tawny Frogmouth from a tree next to one in which its mate is sitting on its nest and pair of eggs. Many Diamond Doves are calling, and Miners and Greenies are numerous elsewhere. One Galah's hollow contained five hard-set eggs on the usual bed of leaves. A Delicate Owl hurriedly leaves a hollow as we pass, and is immediately mobbed by the smaller birds. We wander over the sand-ridge which marks the division between gum-trees and scrub, and note Red-capped Robins, Mistletoe-birds, Caterpillar-eaters, and Chestnut-tailed Tit-Warblers. We return to the box margin and note a Crested Pigeon on its nest twenty feet up in one of these trees. This Pigeon, although edible, seems to be holding its own, and all through the back country it is, if anything, in increased numbers. Changes in environment do not seem to affect it. On the lake we note Grey Teal, Pink-eared Ducks, and a few Grey Duck, *Anas superciliosa*, A small party of Yellow-billed Spoonbills, three White-necked Herons, and about twenty Blue Herons, *Notophoyx novæ-hollandiæ*, are along the margin. A pair of Brolgas rise on their wide-spreading wings and go trumpeting away. To the Mectha tribe of aborigines, who roamed these parts, they were known as "Cooralko," in imitation of their call. Our vernacular name is a corruption of that in use by the aborigines who at one time lived on the Macquarie, and is their version of this bird's call, "Bouralgo."

From a gnarled and ancient box near the margin of the water a Kestrel, Delicate Owl, and Bare-eyed Cockatoo emerge from separate hollows. The Hawk has five eggs, the Cockatoo three, but the Owl none. We are next interested by finding the tree, *Eucalyptus bicolor*, on which Sturt had set his mark, which is overgrown and almost illegible. A Government surveyor has, however, re-marked the tree, a shield-shaped piece of bark having been removed and a broad arrow over "W" and "Sturt, 1845," chiselled into the wood. The tree is in a good state of preservation, and two Parrots were utilizing it for nesting purposes—a Blue-bonnet and a Budgerigar. We pass on and find the timber thinning, and numbers of traces of old camp-fires, with flint chippings, cores, and grinding-stones of the blacks. Dr. Chenery draws my attention to a Black Falcon flying from a group of trees ahead in which there are four old Hawks' nests. We find, after examining the lot, that the fourth, an old Kite's nest, contains a fine set of four eggs of the Falcon. Little of interest engages our attention till we round the bottom end of the lake, when a Delicate Owl is

flushed from a hollow about fifteen feet up in a rugged old box. The hollow, a large one, contained a fine clutch of seven eggs on a bed of woody *débris* and castings. Incubation was at a different stage in each of the eggs, the last laid being quite fresh.

As rain still threatened, we made a late afternoon start back, passing at first through a good deal of stunted Needle-bush, tea-tree, and Mulga, until a few miles from the lake, where the prevalent trees and shrubs are Mulga, Needle-bush, Dead Finish, *Eremophila longifolia*, and *Acacia ligulata*. *Acacia Murrayana* was growing near the lake, but not yet in flower; this is a very fine species with long, narrow phyllodes and a beautiful bright yellow inflorescence. We saw it in full bloom a year previously on the Cooper, where it grew round the Nappa Merrie homestead. We ran on to a long plain between sand-hills, but one of our cars had trouble in negotiating a gutter, and, as the day was drawing to a close, we find a sheltered spot over a sand-hill, and camp for the night. The prevalent vegetation round this camp is Mulga, Needle-bush, Dead Finish, *Acacia ligulata*, *Eremophila longifolia*, *Cassia phyllodinea*, and *Cassia Sturti* in one of its forms, White-wood, Cattle-bush, Wild Cherry, *Santalum lanceolatum*, and *Pittosporum phillyæroides*; much dead grass, Wild Parsnip in flower, *Myriocephalus Stuarti*, *Helipterum polygalifolium*, *Salsola kali*, *Ptilotus alopecuroides*, and two species of Zygophyllum —*Z. podocarpus* and *Z. fruticulosum*.

Next morning, after a good run, the car develops engine trouble, and sticks on top of a sand-hill for a while. Along this ridge are many bushes of *Cassia pleurocarpa* and *Dodonæa attenuata*, with Parakeelya, in full flower, Wild Parsnip, and the usual Composites. A pair of fledged young Wedgebills are quite confiding, and let us snap them sitting on a dead bush. Blue butterflies are here flitting rapidly about the Mulgas, but it is early in the season for others, though *Danaida chrysippus petilia* and *Papilio sthenelus* are present. In the previous spring, summer, and autumn these two species were very numerous throughout the district. The rest of the journey back is uneventful, many nests of the Short-billed Crow being passed, and one nest of the Rufous-crowned Babbler examined and found to contain young. This Babbler keeps to the Mulga scrub, whereas its congener, the White-browed Babbler, frequents the timber along the creeks.

Nearing Yandama we leave the sand and enter the gibber country and the region of the Gidgee and Nalya, *Acacia cana*. We hear that the patient near Mount Sturt is seriously ill, and Dr. Chenery and myself hurry on to the station and go on to see her with Mr. Bartlett, the owner of the station. It is

dark when we arrive, and on our way back our lights fail, and we have a little trouble in keeping to the track.

Next morning we go on to Mount Poole, and later to Milparinka, where we part with our lady companion and her husband, who make the return journey to the Hill, whereas we go on to Tibooburra with the idea of examining the Bulloo flooded country. Our road passes through a Gidgee forest for many miles, then skirts a gum creek. Two old trees stand out from the creek margin. By the road seven Bare-eyed Cockatoos leave separate hollows—two from one and five from the other. The country is undulating and very stony. We flush a female *Ashbyia lovensis* from near the track, but fail to find her nest. Nearing Tibooburra, the stones give place first to sandy country, supporting a scrub of Mulga, Dead Finish, with *Eremophila Duttoni* and Needle-wood. The town consists of one or two streets laid out through large granite boulders, the soil being sandy and auriferous, one of the pastimes of the inhabitants being to search the ground for small specks of gold whenever rain falls and renders them visible. Unfortunately, this is not a lucrative pursuit, as rain only falls at rare intervals.

After a short stay we leave the town, taking a north-easterly road through the boulders. Wild-flowers abound between the boulders and grow from crevices in the rocks, bunches of white-flowering *Isotoma petræa* and the lavender-flowered *Eremophila Freelingii* being the most conspicuous. A little to the north of the town a Blood-wood, *Eucalyptus terminalis*, grows, and, in season, is covered with large bunches of conspicuous cream-coloured or rose flowers. The Sturt Pea, *Clianthus Dampieri*, also grows freely in the valleys; the 1921 spring and summer was a record one for this plant throughout the district, acres being covered with its gorgeous blooms in places. About thirty or more coloured variations were recorded, varying from pure white through shades of pink, red and white, striped, to dark blood-red. The seeds of this pea, though small, can wait for a favourable time to germinate, sometimes thirty years or more. Naturally, it requires good autumn rains to bring it up, the plant makes good growth through the late autumn, and blossoms in June, and continues through the spring months. It will last, under exceptionally favourable circumstances, for four years—that is, when protected in a garden. In a state of nature it is usually an annual, or, at most, a biennial.

When we pass out of the ranges into open country wild-flowers are still plentiful. *Swainsona tephrotrycha* in fine purple patches on the drier ground, with yellow and white composites covering the rest of it. Our road now runs for about twelve

miles through a fine Gidgee forest, the trees growing along a creek amongst the gums and out over the hills and flats that border it. The country becomes more hilly as we approach Mount Wood station, where we pull up to have tea with Mrs. Little, who showed us a fine fossil bivalve and a section of "tree-fern" found on Mount Wood. We cross the creek and go on to the shearing shed, where all hands, including the owner (Mr. Little), are busy. We get directions, and go on through flat country gay with flowering plants, *Swainsona procumbens* covering large areas with its dark purple flowers. A beautiful mauve composite with yellow centre, *Minuria integerrima*, grows in large bunches, and is much admired and prized by the ladies at Mount Wood for its decorative effect. We run by an old yard and deserted public-house, and come to the country from which the flood waters of the Bulloo have subsided; the cattle tracks in the mud are now dry, and make the going very rough. The Bulloo forms a little water system of its own, being separated from those creeks and rivers that run into the central salt lake by the Grey Range. It empties itself into large areas of lignum country that extends well over the New South Wales border, and is there absorbed. Further to the east the Paroo crosses the border at Hungerford, and runs towards the Darling, but is being gradually separated from it, most of its floods being absorbed in lignum swamps before reaching that river.

We reach Coonulpie station, where we interview the owner, Mr. Davies, and his *chef* as to the extent and prospects for bird-life in "the waters." We are disappointed, however, on being told that the breeding of the water-fowl had ended with the subsidence of the flood water. Next morning we are up early. Many Crows and Kites are about the homestead. *Acacia stenophylla* grows thickly at the back of the house, and supports an abundant growth of *Loranthus exocarpi* and *L. lineophyllus*, the latter being covered with its round, white, ripe fruits, attracting a number of Mistletoe-birds to the feast. These birds show no fear, and feed eagerly within two feet of me. Singing Honey-eaters and Greenies were also quite numerous, and Fairy Martins were busily constructing their spouted mud nests under the verandahs. We go on for about three miles and make our camp on a water channel by the road to the "Adelaide Gate" in the border fence. Many Water-hens are about this camp, also Wedge-tailed Eagles, Galahs, White-browed Babblers, and Crested Wedgebills. The creek is bordered with *Eucalyptus microtheca, Eremophila bignoniæflora*, Lignum, Old Man Salt-bush, and smaller plants. After pitching our tent and putting all our baggage and comestibles in it, we all go for a walk towards the cane-grass. This we

enter from the road, and walk through it parallel with one another. The result is disappointing, as it is too dry, a few Chats and Allied Wrens being the principal inhabitants. Dr. Chenery flushed an Amytis, but did not secure a specimen. After a long and fruitless search we come out and make for the creek, and follow it back to the camp. This is well tenanted, mostly by the commoner birds, such as Crested Pigeons. Diamond Doves, Wedgebills, Greenies, Allied Wrens, Grallinas, and a few specimens of that glorious singer of the bush, the Spiny-cheeked Honey-eater. After a late lunch, Dr. Chenery goes back to look up the Amytis, whereas Ian and myself make our way down to the lignum. There is very little water in it, and all water-birds have gone. We return to camp before dark, and decide to return to Tibooburra on the morrow.

Early on the following day we are back at Coonulpie, where we are shown a big hemispherical piece of sandstone with grooves deeply cut into it in varying directions. This, we learn, was used by the natives for sharpening their spears. On our way back several young Australian Dottrel are seen near the track. These are beautiful little things in down, pale grey, slightly rufous down the back, lined and marked with dark brown and black in wavy patterns. They flatten themselves out on the ground after the manner of many ground-birds, and keep perfectly still, and are really very difficult to distinguish from their surroundings. We push on to Tibooburra, and, after a short rest, resume our journey, arriving in Milparinka late in the evening.

Next day we go on our way, but, after passing the bluff, Dr. Chenery and I decide to walk a section of Evelyn Creek, Ian taking the car on for a few miles and walking back to meet us. This creek is a fairly large one, and well timbered with red gum and box. Numbers of Galahs and Bare-eyed Cockatoos are nesting, also a few Budgerigars and occasional pairs of Ring-necks. A solitary specimen of *Acacia farnesiana* attracts my attention, as this is about the southern limit of its range. I had seen this shrub in fair numbers on some of the smaller creeks that run into the Cooper. We find Ian half-way up a box that is growing out from the bank, and from which he has flushed a Spotted Harrier. The nest was about forty feet up, as usual loosely built of fine twigs and lined with leaves and placed on a bushy, horizontal bough; it contained four fresh eggs.

We resume our journey along the Coally flats, resplendent with purple Swainsonas, white and yellow Helipterums, till we enter the sandy country, with its clothing of Mulga, Needle-bush, Dead Finish, and *Eremophila Duttoni*, and under-dress of Myriocephalus, Senecio, and Helipterum. At Cobham we

only delay for a few minutes, then out of the sand over several flats, which were a trial and tribulation to us after rain a year previously, to Iduna and the stony plains, then into the sand again past Packsaddle, to camp on a box and lignum creek about five miles before we come to Bancannia. We decide to look up some lakes and swamps at the back of Bancannia on the following day. We are told there that Bullocky's Swamp is getting low, and that all the Swans and other water-fowl are walking across to Jones's Lake, about a mile from it, with their young broods. Consequently, we follow a very rough track to Bullocky Swamp, which still contains a fair amount of water, with cane-grass growing in it, but very little bird-life. We pick up a camel pad and follow it to Jones's Lake. On the way we come across a pair of Swans walking in the same direction with a brood of downy cygnets. Bullocky had become too shallow, and accessible to foxes and other enemies, and they were making for Jones's Lake, where a larger area of deep water would protect the young till able to take to the wing. We pull up to examine this lake, and find it very open, with a little box on one side and a patch of lignum where a creek runs into it. In this we hear the lively song of the Reed-Warbler and the plaintive notes of the little Grass-birds. Many Teal and a few other ducks are feeding amongst the water-weed and rushes. We pick up the camel pad again and make our way to Wyalla Lake. This is very full, and contains much timber standing in water. The weather has, however, become very threatening, and rain evidently falling to the south, so we decide to make back to the road before our retreat is cut off. We make good progress till near Sandy Creek bore, where a heavy shower gives us a difficult track for several miles, and delays our arrival at Fowler's Gap. We replenish our water and go on for about five miles before having our lunch late in the day.

The Euriowie hills are gayer than when we went up, *Acacia loderi* being now in flower all over them, the ground being carpeted with a brilliant yellow mass of *Helipterum polygalifolium* or with the paler yellow of *Craspedia chrysantha*, and white with *Helipterum corymbiflora* and others. As we emerge from these hills we meet a motor party, and are cautioned by them to be careful of the next few miles, as a very heavy hailstorm had just crossed the track. We soon find this to be true, the hail being banked up under every bush and all the water-courses running. We make every effort to cover as much of the road as possible before dark, but the last nine miles is in inky darkness, with most of the ground under water. However, we reach Broken Hill without any mishap.

Wild-Flower Exhibition.—Miss C. C. Currie, of Lardner, writes that the statement on page 82 of the November *Naturalist* that the specimens of *Boronia pinnata* exhibited were collected by the Misses Bingham, Hardie, and Maddock at Jindivick is incorrect, and that the flowers in question were collected at Athlone, in quite another direction, by her brother, Mr. T. Currie.

The Mueller Medal.—This medal, founded in honour of Baron von Mueller, and awarded by the Australasian Association for the Advancement of Science at its meetings to eminent workers in Australian natural science, has this year been bestowed on Mr. J. H. Maiden, F.R.S., F.L.S., &c., Government Botanist of New South Wales and Director of the Sydney Botanical Gardens. Mr. Maiden is well known for his splendid contributions to botanical literature, and we feel sure the choice will be a popular one throughout Australia.

South Australian Brown Coal.—The *Transactions of the Royal Society of South Australia* for 1922 (vol. xlvi.) contain a joint paper by Sir Douglas Mawson, D.Sc., and Mr. Frederick Chapman, A.L.S., F.R.M.S., on the brown coal deposits of Moorlands, situated between Murray Bridge and the Victorian border. The deposit appears to cover a considerable area, probably the greater part of the great Murray delta of Tertiary times, and resembles the Morwell deposit, though, so far as known, does not possess the great depth of that formation. However, as South Australia is deficient in coal-bearing strata, it will probably prove of great commercial value in years to come.

The Genus Pultenæa.—In continuation of his work on the genus Pultenæa, an extensive genus of the Australian Leguminosæ, Mr. H. B. Williamson, F.L.S., contributes to part 1 of vol. xxxv (n.s) of the *Proceedings of the Royal Society of Victoria* (Dec., 1922) the third instalment of his revision of the genus. In this he deals critically with seventeen species, six of which are hitherto undescribed. Three of these are Victorian—*P. D'Altonii*, from Nhill ; *P. Readeriana*, from the Grampians, collected by the author in 1907 ; and *P. prolifera*, collected by Miss Sceaney at Carlisle River, 1906. Unfortunately, according to the Vienna rules of priority, our unique species, *P. rosea*, F. v. M., of the Grampians, loses its well-known name and becomes *P. subalpina*, Druce. The genus is a difficult one, the differences between species being in many cases very slight, depending on such particulars as size of calyx lobes, bracts, or bracteoles. The paper is illustrated by drawings of the new species.

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— OF —

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The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	149
Excursion to Nar-Nar-Goon	152
Excursion to Upwey	152
Excursion to Torquay	153
On a Cast of a Fossil Sea-Urchin from the Red Sands of Studley Park, Kew. By Frederick Chapman, A.L.S.	158
Note	159

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1923.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 12th MARCH, 1923.

1. Correspondence and Reports.
2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Mr. Willoughby Curtois, 7 Erskine Street, Malvern.	Mr. A. E. Keep.	Mr. C. Oke.
Mr. Allan T. Latham, 26 Scott Street, St. Kilda.	Mr. A. E. Keep.	Mr. C. Oke.
Mr. A. N. Lewis, "Wallington," Hotham St., East Melb.	Mr. C. Oke.	Mr. C. Daley, F.L.S.
Mr. V. Miller, High Street, St. Kilda.	Mr. W. Glance.	Mr. C. Oke.
Mr. Walter J. Parr, 18 Bokhara Road, Caulfield.	Mr. F. Chapman, A.L.S.	Mr. A. S. Keep.
Mr. C. F. Argyll-Saxby, Sondan United Mission, 182 Collins St., Melb.	Mr. C. Barrett, C.M.Z.S.	Mr. C. Oke.
Mr. Joseph H. Woodward, 1 Rathdown St., Carlton.	Mr. A. G. Brown.	Mr. C. Oke.

3. Nominations for Membership.
4. General Business.
5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.
6. Reading of Papers and Discussion thereon.
   1. By Mr. H. B. Williamson, F.L.S.—"Our Alpine Flowers." (Illustrated.)
   2. By Mr. F. Chapman, A.L.S.—"On Concretionary Limestones in General and on Pebbles from Lake Omeo in Particular." (Illustrated.)
   3. By Mr. J. C. Goudie—"Notes on the Coleoptera of North-Western Victoria," part ix.

Note.—It is particularly desired that members who had the opportunity of collecting or observing in country districts during the recent holidays will give brief notes on their experiences.

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.
8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

CHANGE OF ADDRESS.

Any Member whose address, as written on the wrapper of the *Naturalist*, is not correct should communicate with the Hon. Sec. *at once*, as it is intended to publish the Members' Roll in the April *Naturalist*. Street numbers are desired in all cases.

The Victorian Naturalist.

Vol. XXXIX.—No. 11. MARCH 8, 1923. No. 471.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th February, 1923. The president, Mr. C. Daley, B.A., F.L.S., occupied the chair, and about sixty members and visitors were present.

CORRESPONDENCE.

From Mr. C. French, sen., thanking the Club for his election as an honorary life member, and wishing the Club continued success.

REPORTS.

A report of the excursion to the Botanic Gardens on Saturday, 23rd January, was given by the leader, Mr. E. E. Pescott, F.L.S., who said that there had been a large attendance of members and friends. A general ramble had been taken through the Gardens, and notable trees, &c., pointed out. The propagating grounds and houses had also been visited, and many interesting plants seen.

A report of the excursion to Torquay on Saturday–Monday, 27th–29th January, was given by the leader, Mr. F. Chapman, A.L.S., who gave a very interesting account of the outing, during which a fair number of fossils were collected from the limestone cliffs in the vicinity of Bird Rock. The aboriginal ovens and shell mounds near Bream Creek had also been visited, and the members of the party were much impressed by the evidences of human industry displayed in the remains. Later he exhibited several lantern slides of incidents of the excursion.

A report of the excursion to Eltham on Saturday, 10th February, was given by the leader, Mr. F. E. Wilson, who reported a large attendance of members, but, owing to the heat of the day, their reward was not equal to the enthusiasm displayed. Insects, on the whole, were scarce, and only some of the commoner species were recorded.

ELECTION OF MEMBERS.

On a ballot being taken, Miss Maude M'Lean, 314 Cardigan-street, Carlton, and Mr. R. B. Paul, 280 Bourke-street, Melbourne, were duly elected as ordinary members of the Club.

GENERAL BUSINESS.

The president said that the committee had decided to recommend that the seven "original" members remaining on the Club roll be elected life honorary members of the Club. These were Messrs. W. M. Bale, F.R.M.S., F. G. A. Barnard,

D. Best, J. E. Dixon, F. Pitcher, T. G. Sloane, and F. Wisewould. They had been elected in May or June, 1880, and had kept up continuous membership of the Club ever since. He thought it well that these members should be honoured for their faithfulness to the Club while still alive and taking an active interest in its work, rather than that their memory should be honoured later on. He moved to that effect. The motion was seconded by Mr. E. E. Pescott, F.L.S., and carried unanimously.

Messrs. F. G. A. Barnard and F. Pitcher returned thanks on their own behalf and on behalf of their fellow "original" members for the honour conferred upon them, and hoped they might be long spared to attend meetings of the Club.

The president extended a hearty welcome to Mr. A. N. Lewis, of Hobart, a member and past president of the Tasmanian Field Naturalists' Club, Hobart. Mr. Lewis briefly responded, and thanked the meeting for its welcome.

PAPERS READ.

1. By Mr. A. L. Scott, entitled "Notes of a Geologist in New Zealand."

The author said that he did not claim to be a geologist, but he proposed to illustrate, by means of lantern slides, some notes made during a recent holiday of a couple of months in New Zealand. Dealing with the hot lake district of the North Island and with Mount Cook and the surrounding mountains in the South Island, he gave some account of the geological features as seen by visitors.

2. By Mr. Chas. Oke, entitled "Notes on Victorian Chlamydopsini (Coleoptera), with Descriptions of New Species."

The author gave some general notes on a number of beetles which live principally in ants' nests—for what reason is not really understood. Several descriptions of new species were taken as read.

REMARKS ON EXHIBITS.

Mr. E. E. Pescott, F.L.S., drew attention to Mr. T. Green's exhibit of flowers of the rare Mint-bush, *Prostanthera Walteri*, from Buffalo Mountains, found only there, on Mount Kosciusko, and on Mount Ellery, in East Gippsland.

Mr. F. G. A. Barnard drew attention to a fresh specimen of the rare fungus, *Polyporus mylittæ*, commonly known as "Native Bread." This had developed from a specimen of the sclerotium exhibited by Mr. A. G. Brown at the previous monthly meeting of the Club. He also gave some account of the early history of this fungus.

Mr. H. B. Williamson, F.L.S., said that he had grown the fungus from damaged portions of the sclerotium.

EXHIBITS.

By Mr. F. G. A. Barnard.—Fructification of fungus, *Polyporus mylittæ*, commonly known as "Native Bread"; also egg-cup carved from the sclerotium, lent by Mr. D. M'Alpine.

By Mr. F. Chapman, A.L.S.—Photographs and lantern slides of Torquay and Bream Creek; shells of *Succinea australis*, Ferussac, from charcoal stack at Bream Creek; barnacles from shore pools at Rocky Point (Balanus and Scapellum); *Porina gracilis*, a fossil Polyzoan, from limestone slab (Miocene) at Spring Creek, Torquay; rolled fragments of travertin limestone.

By Mr. C. French, jun.—Fine specimens of remarkable gall-making coccids (scale insects), *Apiomorpha strombylosa*, male and female, from Diamond Creek, Victoria; also a specimen of the so-called Crested Grasshopper, *Alectoria superba*, a rather rare and remarkable insect, from Benalla, Victoria.

By Mr. T. Green.—Flowers of *Prostanthera Walleri*, F. v. M., a rare Mint-bush, from Mount Buffalo.

By Mr. A. E. Keep.—Wallaby and wombat bones from aboriginal kitchen middens on sand dunes near Bream Creek, Torquay; fossil corals and shells from ancient sea mat reef, in polyzoal limestone rock (Miocene period), from Torquay beach, near Spring Creek.

By Mr. C. Oke.—Insects from Eltham excursion; a specimen of *Chlamydopsis setipennis*, n. sp., under microscope, in illustration of paper.

By Mr. A. E. Rodda.—Growing fern, *Grammitis rutifolia*, Kororoit Creek, near Braybrook.

By Mr. A. L. Scott.—Maps and photographs in further illustration of his paper.

By Mr. A. J. Tadgell and Mr. A. G. Hooke.—Twenty-one species of Alpine flowers and ferns, fresh, from Mount Bogong, Victoria—*Blechnum penna-marina* (*Lomaria alpina*), *Brachycome Tadgellii*, *Eucalyptus coriacea* (bark, fruit, and flowers), *Exocarpus nana* (fruit and flowers), *Herpolirion novæ-zealandiæ*, *Didiscus humilis*, *Veronica serpyllifolia*, *Thelymitra venosa* (in sphagnum), *Aciphylla glacialis*, *A. simplicifolia*, *Podolepis longipedata* (*robusta*), *Senecio pectinatus*, *Celmisia longifolia*, *Gentiana saxosa* (mountain form), *Helichrysum rosmarinifolium*, *H. rosmarinifolium*, var. *ledifolium*, *H. baccharoides*, *Bæckea Gunniana*, *Colobanthus Billardieri*, *Polypodium australe* (mountain form), *Trisitum subspicatum*, *Scleranthus uniaroides*, *Olearia ramulosus*, var. *communis* (syn. *Olearia ericoides*), rare.

By Mr. L. Thorn.—Case containing four species of Emperor moths—viz., *Antheræa eucalypti* and *A. helena*, from Victoria, *A. simplex* and *A. janetta*, from Queensland; *A. eucalypti* and *A. janetta* showing considerable variation in the markings.

By Mr. H. B. Williamson.—Flying phalanger, picked up dead at Dandenong.

After the usual conversazione the meeting terminated.

EXCURSION TO NAR-NAR-GOON.

(Abridged.)

THE visit to the country lying to the north of Nar Nar Goon, on Saturday, 18th November, was very enjoyable owing to the weather experienced and the large variety of flowers met with, leguminous shrubs, &c., being very plentiful. Among these were *Pultenæa villosa*, Hairy Bush-Pea, *Platylobium formosum*, Handsome Flat-Pea, *Dillwynia floribunda*, Crowded Parrot-Pea, *Gompholobium Huegelii*, Dwarf Wedge-Pea, and *Sphærolobium vimineum*, Leafless Globe-Pea. After passing a sawmill we were attracted by a young forest of Messmate (*Eucalyptus obliqua*) saplings; these were at least forty feet in height, and, we were informed, were only about six years old—an evidence of the rapid growth of trees in this district. Several other species of eucalypts were noted about here. Descending into swampy country, near Dingo Creek, some fine young plants of *Pultenæa Weindorferi*, one of the handsomest species of this genus, were seen. The Forked Sundew, *Drosera binata*, decked a wet bank with its delicate white flowers, while the bright blue flowers of *Lobelia gibbosa* and the golden yellow of *Goodenia ovata* added colour to the scene. Altogether over eighty species were seen in bloom, indicating that in a late spring good collections of flowering plants could be made in the district.—J. W. AUDAS.

EXCURSION TO UPWEY.

SIX members went to Upwey, on the southern slopes of the Dandenong Ranges, by the early train on Saturday, 16th December. On leaving the station we crossed the line and entered a patch of swampy ground not far from the railway. Here there were odd branches of Leptospermum still out in flower. On these were a few common beetles, mostly Stigmodera —*S. erythroptera*, *S. crenata*, and *S. australasiæ*—and Mordellids. A few Hymenoptera were flying around, principally Thynnid wasps and Ichneumon flies, though one very pretty saw-fly was seen. Numerous specimens of the Mountain Brown Butterfly, *Epinephile abeona*, were on the wing, and two or three were caught. We followed a narrow track up the hill and came to a most enchanting spot, where the Eucalyptus trees were growing closely together and the ground was covered with beautiful green grass. Here it was remarkable the number of orb-spinning spiders that had spread their webs. No doubt they appreciated this nice, quiet, shady spot, but not for itself; it is merely cupboard-love, because it is places like this that bush flies and moths delight in—hence the spiders. Some of these latter were very brightly coloured, one in particular that attracted attention being a pretty shade of buff, silvery

along the sides, lemon on top, with maroon markings. Here we also obtained three specimens of a Pterostylis, which, it is thought, may be new to science. Continuing our way, we crossed the creek and ascended a little further up the hill. It was then decided to work towards a good spot of which the leader knew. Collecting and observing a few insects as we went, we just wandered on, and seemed to arrive at nowhere in particular, till the ladies declared it was lunch time. This proved to be the chance to look for small things, and some interesting little insects were seen. Included among the latter was a very small Staphylinid beetle; it is smaller than the head of a "lillikin," and under the microscope appears rather like a Conosoma with large bristles on its antennæ and abdomen. It is black, with a reddish "tail." On the gum-trees were numerous examples of that gaily-coloured spider *Nicodemus bicolor*. This is of a pretty shade of blue, with pink or red (the colour varies), and is apparently quite harmless, though its colours put it in the alleged "danger" class. The males have a peculiarly-shaped pedipalp, and these are well worth a close inspection. As some of the party wanted to catch an early train, we all decided to walk back towards the main road. Under a gum-tree we found six spikes of the Potato Orchid, *Gastrodia sesamoides*; one spike had twenty-five flowers and buds on it. From some blackberry bushes growing near the track we obtained three species of Skipper butterflies, all well-known species. On the flat, near the main road, a spike of a Cryptostylis was noticed. As it was only in bud it was passed over; but on second thoughts it was decided to dig it up, as it appeared to be a little different from the ordinary form. Seven days later it came out, and it proved to be *C. leptochila*, a rather rare orchid. After a further short ramble up the hills we made our way back to the station in time to catch the last train home, well satisfied with a pleasant day's outing. I am indebted to the late Mr. J. R. Tovey for the identification of *Cryptostylis leptochila*. This was almost certainly the last determination he made, as it was long after closing time when I left his office, and he passed away the same evening.—CHAS. OKE.

EXCURSION TO TORQUAY.

THIS year the Foundation Day excursion was arranged for Torquay, a locality not hitherto visited by a Club excursion. Torquay, well known for the profusion of its Tertiary fossils, is situated on the western shores of Bass Strait, about sixty miles from town (*via* Geelong). A small party, including two ladies, left town by the mid-day train on Saturday, 27th January, and by 2.30 p.m. the luggage had been left at the respective

boarding establishments, and we had turned our steps towards the cliff section in the direction of Bird Rock. Passing the golf links and over Spring Creek, it was noticed how low the sand-dunes were compared with former years, before the marram grass was planted, though the grass was really responsible for the retention of the dunes such as they are at present. Along the foreshore the old dune, of Pleistocene age, was observed, where it lies surmounted by the more recent sand-dunes, the former being hardened by percolation and deposition of carbonate of lime, and showing occasional layers of travertin where there happened to be springs in the vicinity. Passing Spring Creek mouth, now barred up by blown sand, the Middle Tertiary limestone was seen in tumbled blocks. They were eagerly scrutinized for the remains of brachiopods (*Magasella*, *Terebratella*, and *Terebratulina*), for echinoids (*Scutellina*, *Lovenia*, and *Eupatagus*), and polyzoa (*Porina*, *Adeona*, and the profuse and multiform *Cellepora*). The latter sometimes constitutes the bulk of the polyzoal rock, and, as the zoaria was frequently branched and massive, this gave the appearance of a raft of matted twigs. We may thus picture how like a thick scrub the sea-bed must have looked when the polyzoal limestone was forming at the bottom of the fairly deep and comparatively clear sea of the Janjukian of this phase of palæogeography. All the members of the party were converted to the ways of geologists on the spot, and hammers and penknives were put to the best use in extracting medals of creation and boxing them for safe carriage. This intense interest in the fossils accounted for the time slipping past unnoticed, and the return for tea had to be made with record speed.

Joined by a visitor to the district, who showed himself to be an ardent geologist, we started early the next day for a quiet stroll into the country and along the shore towards the Bird Rock section. Turning off near the No. 1 Torquay oil-wells boring at the Jan Juc Creek, two of the party crossed to the Sheoak Gully and down the Fishermen's Steps, where they met the remainder after their scramble over fallen rocks and stretches of sand. As far as a rising tide would allow, some interesting fossils were secured from the Spring Creek Ledge, the *Trigonia* and coral beds, and the *Spirulirostra* bed. From the latter our friend Mr. Parr was so fortunate as to find two examples of this very rare fossil a few days before the party arrived, and members were shown the actual places where they were found. A welcome rest was taken in Sheoak Gully, where Mr. Barnard said a few words about the plants met with, and we exchanged notes while the billy boiled. Proceeding south-westerly along the top of the cliffs, Rocky Point was reached. Here we descended to the beach and peered into the beautiful rock pools that are

revealed to curious terrestrial bipeds twice in the day. But it requires an Alfred Noyes to do justice to this scene :—

> "Bright as a fallen fragment of the sky,
> 'Mid shell-encrusted rocks the sea-pool shone,
> Glassing the sunset clouds in its clear heart,
> A small, enchanted world enwalled apart
> In diamond mystery,
> Content with its own dreams, its own strict zone
> Of urchin woods, its fairy bights and bars,
> Its daisy-disked anemones and rose-feathered stars."

Here we saw strange-looking barnacles (*Balanus* and *Scalpellum*) and maroon-coloured anemones, with flecks of pure sky-blue at the tentacle base ; whilst the seaweeds were here in profusion —a gently undulating flora of a beautiful marine rock-garden. It is along the cliff-section on this Point that the soapy clay bands can be traced as soft undercut layers beneath salient ledges of hard, iron-stained limestone ; they are on the same horizon as at Zeally Bay, about five miles away to the north-east, representing two legs of the same anticline. This band of marl is rich in Foraminifera in a beautiful state of preservation, as the leader discovered in 1903. One of the younger members collected a few pounds of this material to work through at his leisure, and this will keep him occupied for many evenings. The fossils particularly numerous here are the echinoids, several of which were obtained ; and this is the classic spot where Dr. T. S. Hall found his fine specimen of the Patagonian shark tooth, *Carcharoides*, now to be seen in the National Museum. The return to the township was made over the old cliff road, the high-level gravels with quartzite—evidence of a much older river system—being noticed by the way.

Monday morning was devoted to a ramble along the shore to near the mouth of Bream Creek. The objective was the sand-hills, where the marram grass has not yet quite spoiled the wonderful wind effects in remoulding the beautiful hill forms, where cirques, mounds, slides, and ripples can be studied with advantage. The beach along this route proved very barren in molluscan life, only *Scutus anatinus* and *Mactra rufescens* (several isolated valves) being noted. Two fair-sized "gummies" (*Cestracion* or *Heterodontus*) were lying stranded, in fresh condition, on the foreshore. In the middle distance was seen what looked like a piece of wreckage with a row of rusty hook-nails projecting from it in a serried line ; but, on approaching the spot, the apparent ironwork moved away in line formation, and revealed itself as a body of Cormorants, which had been resting after a fish dinner. As we approached the dunes the abundance of the aboriginal shell mounds impressed itself on one. Where the sand-blows had uncovered large areas, the surface of the ground, as one member remarked, resembled in the distance a daisy field, with the nacreous

white of the *Turbo* shells (fig. 1) glistening in the sun. In one or two instances blackfellows' ovens were seen to perfection, with the blackened stones, chiefly limestone and basalt, lying in fairly regular circles on a slightly elevated mound. A travertin ledge is here exposed, which apparently dates back to the old dune formations of the corresponding exposures of Sorrento and Warrnambool. Portions of this travertin had broken away, and, probably by wind erosion and rolling action, had formed rounded masses of the size of a cricket ball. The force of the wind is so great as to roll up echinoids in their fresh state from the beach, the genera *Heliocidaris* and *Amblypneustes* both being apparently represented. What was perhaps the most remarkable of these phases of this sand-dune formation which we saw was a stack of blackened sand (fig. 2) standing up by reason of its superior hardness in a hollowed area in front of the great dune. That here it was once more swampy and overgrown with vegetation was shown by the numerous shells of *Succinea australis*, Ferussac, found in the sand of the hard stack mentioned. A shell of the helicoid *Laoma penolensis*, Cox, sp., was also found with the *Succinea*. This evidence, together with that of the destruction of the tea-tree, under which the blacks must have formerly camped, gives to this tribe, at all events, a fair antiquity, for the immediate surroundings are now quite bare and sand-covered. This part of our excursion gave us quite a different aspect of coast scenery, and formed a fitting close to our short visit to Torquay. After lunch we spent a profitable hour on the Rocky Beach portion of the foreshore, returning to Geelong in good time to catch the 5.55 train to town.

It may be of interest to future visitors to have a list of the seaweeds which I collected about twenty years ago at Torquay, and which have been lately named for me by our esteemed fellow-member and high authority on this group, Mr. A. H. S. Lucas, M.A., B.Sc. : — PHÆOPHYCEÆ (Brown Seaweeds). — *Cystophora Brownii*, J. Ag., *C. platylobium* (Mert.), J. Ag., *C. retroflexa* (Lab.), J. Ag., *Cystophora*, sp., *Melanthalia obtusata* (Lab.), J. Ag., *Seirococcus axillaris* (R. Br.), Grev., *Zonaria Turneriana*, J. Ag. CHLOROPHYCEÆ (Green Seaweeds). —*Caulerpa Muelleri*, Sond. RHODOPHYCEÆ (Red Seaweeds).— *Acrotylus australis*, J. Ag., *Ballia callitricha* (Ag.), Mont., *Callophyllis Lambertii* (Turn.), Grev., *Cardiæa laciniata*, Harv., *Corallina Cuvieri*, Lamour., *Delisea pulchra* (Grev.), Mont., *Haloplegma Preissii*, Sind., *Hypnea*, sp., *Melobesia patena*, Hook. and Harv., *Monospora Griffithsioides* (Sond.), De Toni, *Phacelocarpus Billardieri* (Mert.), J. Ag., *Plocamium Mertensii* (Grev.), Harv., *Pterocladia lucida* (R. Br.), J. Ag., *Rhabdonia coccinea*, Harv., *R. nigrescens*, Harv., *Rhodymenia australis*, Sond., *Stenocladia Harveyana*, J. Ag. This list could doubtless be considerably augmented by further collecting.

PLATE III.

FIG. 1.—SHELL MOUNDS, NEAR BREAM CREEK.

F. C. *photo.*

FIG. 2.—CHARCOAL STACK, NEAR BREAM CREEK.

F. C. *photo.*

I am indebted to Mr. F. G. A. Barnard for the following notes on the botany and entomology of the trip. He says:—"The botany of the Torquay excursion does not call for any extended account. Of course, the end of January is not the time for a great variety of flowering plants to be found in bloom. The most prominent were the Small-flowered Tea-tree, *Melaleuca parviflora*, and the Sweet Bursaria, *Bursaria spinosa*. The former occurred on the tops of the cliffs along the shore, while the Bursaria was generally seen further inland. The Golden Wattle, *Acacia pycnantha*, with here and there the Varnish Wattle, *A. verniciflua*, seems to have covered most of the country around the township. It still remains in considerable numbers, and should form a pleasant sight in the early spring. Other shrubs near the coast were the Common Correa, *Correa speciosa*, which assumed an ornamental form somewhat different to that occurring at Sandringham, and *Correa alba*, which was in bloom, bearing star-shaped flowers resembling an Eriostemon. Other coastal shrubs were *Styphelia richea*, on which a few white wax-like fruits still remained, and *Lasiopetalum Behrii*, which bears pink, solitary blooms in the spring. During a ramble towards the oil borings and Point Addis more wooded country was seen, with gums, Silver Wattles, Casuarinas, and Native Cherries. Of the former, the Messmate, *E. obliqua*, was in bloom in several places. Here a rather unfamiliar shrub, *Thomasia petalocalyx* (Sterculiaceæ), was met with in bloom, and occasionally in the almost prostrate vegetation were flowering plants of the Native Heath, *Epacris impressa* (pink). The Cranberry, *Astroloma humifusa*, was also found in bloom. *Cryptandra vexilifera*, *Olearia* (*Aster*) *axillaris*, *Comesperma polygaloides*, *Scævola microcarpa*, *Erythræa australis*, and *Helichrysum apiculatum* were other small plants found in bloom. Numerous introduced plants were seen, of which a grass, *Lagurus ovatus*, Hare's Tail Grass, was both conspicuous and ornamental.

"ENTOMOLOGY.—Insects were well represented during our outings by the common house-fly, or one very like it, which followed us in places by the thousand, and March flies, otherwise few insects were seen: though the Bursaria was looked over in several places, only a ladybird was seen on it. Two or three specimens of the Wood Brown Butterfly, *Heteronympha merope*, were all the lepidoptera noted, but a fine orthopterous insect of the grasshopper family, with pale-coloured body and long antennæ, *Apotrechus unicolor*, Br., Long-horned Locust, was secured, and presented to the National Museum."

The party returned to town on the Monday evening, well pleased with their short visit to such an interesting locality, regretting that it was so far from town.—F. CHAPMAN.

ON A CAST OF A FOSSIL SEA-URCHIN FROM THE RED SANDS OF STUDLEY PARK, KEW.

By FREDERICK CHAPMAN, A.L.S.

INTRODUCTORY.—The chief interest of this short note lies in the occurrence of an undoubted marine fossil in the Red Sands covering the Nillumbik peneplain at Studley Park. These sands have been hitherto regarded as purely fresh-water or sub-aerial accumulations; and, further than this, the present discovery of a cast of a Kalimnan sea-urchin helps to decide the age of these Red Sands as Lower Pliocene, and belonging to the same series as the main part of the Beaumaris cliffs and the Brighton ironstone beds.

DESCRIPTION.—The specimen under notice is a cast of the test of a spatangoid sea-urchin, in a whitish or slightly ferruginous sandstone, composed of rounded and subangular quartz grains. The internal impressions of the ambulacral grooves, due to their slight projection within the test, are seen in this cast as distinct furrows. The cast of the test agrees in the main with *Lovenia*, and, in fact, is the only Kalimnan genus to which it shows any resemblance. The test must have been subjected to some compression during fossilization, as the cast is only slightly convex aborally. At present the specimen is split in two along the lines which indicate the anterior and left posterior furrows. The left anterior groove is twisted out of its proper angle some 25 degrees, which might easily have happened through crushing: this groove is bordered by rather definite lines, and agrees with the lines seen on the edge of the ambulacrum mentioned. The right anterior ambulacral groove is curved at its normal angle, dipping steeply down to the apical region, and carried over to the ambitus. The crack which was induced along the left ambulacral groove is developed along one side of the ambulacral area. The right posterior ambulacrum is marked out by an irregular sulcus, probably the junction line of the pairs of plates forming the ambulacrum.

On the oral side the cast is nearly flat, but rounded at the ambitus. The peristomal depression is indicated not only by a hollowing of the surface, but the margins, feebly ridged, are seen both at the left and right, where the left anterior and left posterior and the right anterior and posterior ambulacra respectively meet.

CONCLUSIONS.—There are, to my mind, sufficient indications to show that the furrows, general shape, and depressions on the fossil cast are not accidental, but due to the former presence of an echinoid test surrounding the sandy matrix, and that the balance of evidence is in favour of the genus *Lovenia*.

Detailed microscopic examination of these sands, especially

PLATE IV.

ABORAL ASPECT.

ORAL ASPECT.

CAST OF A FOSSIL SEA-URCHIN (*cf.* LOVENIA) IN KALIMNAN RED SANDS, STUDLEY PARK, KEW.

VIEW OF THE KALIMNAN RED-SAND PIT, STUDLEY PARK, KEW.

Photo. by MISS I. CRESPIN, B.A.

some samples obtained for me by Mr. H. Prentice, has shown the presence of fresh-water sponge spicules, such as have already been found in other localities in the same Red (Kalimnan) Sands, as at Balwyn (by myself) and at Canterbury (by Mr. N. Benporath).

Judging from this evidence, we may infer that the above cast indicates a close proximity to the marine shore-line, and that the spicules may have been, at this locality, washed into the littoral accumulation from higher and swampy ground.

OCCURRENCE.—The above fossil was found at the sand-pit above Studley Park during Prof. Skeats's excursion of Part I. geology students in 1917.

I would here express my sincere thanks to Prof. Skeats for the opportunity of examining and describing this very interesting fossil; also to Miss Irene Crespin, B.A., for so kindly taking the photograph of the section where the fossil cast was found.

POLYPORUS MYLITTÆ.—With reference to my exhibit at to-night's meeting of the fungus *Polyporus mylittæ*, Cooke and Massee, it is perhaps worth while calling attention to the mystery which for so many years surrounded this fungus, or, rather, the absence of the fungus. For fifty years or so the substance known as Native or Blackfellows' Bread had been discussed, but no definite conclusion had been come to regarding it until October, 1892, when Dr. M. C. Cooke, the well-known mycologist, announced in the *Gardeners' Chronicle* that at last the complete plant had been received, and that he intended to name it as *Polyporus mylittæ*. That specimen was reported to have come from South Australia, but there is no doubt that it was a specimen sent from Victoria by Mrs. Martin, better known in the early days of our Club as Miss F. M. Campbell, an ardent fungus collector. In May, 1904, our late member, Mr. H. T. Tisdall, read a paper on the subject (*Vict. Nat.*, xxi., p. 56), stating that in 1884 he received a sackful of Native Bread from a friend at Rosedale (Gippsland). These he tested in various ways to see if they were really edible, but could make nothing of them, so they were put away in a sort of cellar he had dug in the hillside at his house in Walhalla. Going to the cellar some months afterwards, he was surprised to find that some of the "bread" had developed a "parasitic" growth resembling a fungus which, he considered, belonged to the genus Polyporus, and as such exhibited drawings, &c., at the Club meeting of 11th November, 1885 (*Vict. Nat.*, vol. ii., pp. 94, 109, Jan., 1886), and expressed his intention of sending specimens to Dr. Cooke. This, according to Mr. D. M'Alpine in an article in the *Naturalist* for August, 1904 (vol. xxi., p. 59), was the first undoubted notice of the fructification of the

Mylitta,* as it had been known, and Mr. Tisdall was the first person to recognize it as a Polyporus and not a Mylitta, it having been supposed to be a member of the truffle family. It was scientifically described by Dr. Cooke in *Grevillea* for December, 1892. Mr. M'Alpine has kindly forwarded me a copy of a letter received by him in January, 1905, from Sir William Thistleton-Dyer, Director of the Royal Botanic Gardens, Kew, London, in which he acknowledges a copy of Mr. M'Alpine's article on the subject in the *Journal of Agriculture*, Victoria, for November, 1904, and says:—"Unfortunately, Mrs. Martin's specimen, on which *Polyporus mylitta* (*sic*) was founded, and which was therefore the type, was returned to her at her request. We have no specimen at Kew, and would be most grateful to you if you could procure us one. We have plenty of old specimens of the sclerotium, but none of the Polyporus, either separately or attached." From this note it will be seen that Mr. Tisdall must have failed to carry out his intention of sending specimens to Kew in 1886, or he would have been recorded as the first sender. However, Mr. M'Alpine filled the gap at Kew, which is acknowledged in a letter dated Kew, 4th March, 1905. Mr. M'Alpine says, in response to my application to him for information about this rare fungus:—"When keen on the hunt for specimens of Native Bread I found them most plentiful at Emerald, in the nursery of the late Mr. Nobelius. I was able to get sackfuls of the sclerotia, and, as they were about the consistency of cheese when freshly gathered, I was able to carve out various articles, such as pipes, teaspoons, egg-cups, &c. I have often thought since that disabled returned soldiers might manufacture out of this substance various kinds of genuine Australian curios, for which there ought to be a ready sale." He forwarded as an exhibit an egg-cup which had been cut out as suggested, making a very useful article. It is so hard now that one can hardly make an impression on it with a sharp pen-knife. It seems to me that the fungus may be more common than is usually supposed, as from its mode of growth it might often be gathered, even by a field naturalist, without any suspicion that it was attached by perhaps a rather long stem to the underground substance known as Native Bread. The specimen exhibited to-night grew from a broken sclerotium which was soft when I got it, and was put on a shelf as a curio. I did not happen to notice the growth, which is of velvety appearance and lemon-coloured, for about a fortnight afterwards, so whether it grew while the mass was soft, or after it had hardened, I cannot say. As it is so rare, it is my intention to hand the specimen to the National Herbarium, which, I understand, does not possess a specimen.—F. G. A. BARNARD. 12th February, 1923.

* The reference in Cooke's "Australian Fungi" (1892) is—"1351, *Mylitta australis*, Berkeley—spores unknown."

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Hon. Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions recorded.

CONTENTS:

	PAGE
Field Naturalists' Club of Victoria	161
Excursion to Black Rock	164
The Measuring of Tall Trees. (With Plate.) By A. D. Hardy	166
Notes	165, 175, 176
Our Fortieth Volume	176

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1923.

Field Naturalists' Club of Victoria

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA STREET, MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

MONDAY EVENING, 9th APRIL, 1923.

1. Correspondence and Reports.

2. Election of Members.

As Ordinary Members—	Proposer.	Seconder.
Mrs. Shiels, Lisson Grove, Hawthorn.	Miss G. Nethercote.	Miss E. Hewitt.
Mr. J. R. T. Mannix, Botany Dept., University, Carlton.	Mr. F. P. Morris.	Mr. J. W. Audas, F.L.S.

3. Nominations for Membership.

4. General Business.

5. Remarks by Exhibitors relative to their Specimens.

   Ten minutes' adjournment for discussion of Exhibits.

6. Reading of Papers and Discussion thereon.

   1. By Mr. J. Stickland—"Notes on the Protozoa of Melbourne District."
   2. By Messrs. C. J. Gabriel and J. H. Gatliff—"On a New Marine Bivalve Shell, *Hemidonax Chapmani*."
   3. By Mr. R. Kelly—"Thrips: an Unpopular Insect, treated Popularly."

Note.—It is particularly desired that members who had the opportunity of collecting or observing in country districts during the recent holidays will give brief notes on their experiences.

7. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to inform the Secretary of the same that he may arrange for their bringing them before the meeting; such notices should, however, be brief.

8. Exhibition of Specimens and Conversazione.

   Members are invited to exhibit objects of interest, and to furnish the Hon. Secretary with written particulars for record in Minutes and *Naturalist*. Brief descriptions should accompany the exhibits for the benefit of fellow-members.

CHANGE OF ADDRESS.

Any Member whose address, as written on the wrapper of the *Naturalist*, is not correct should communicate with the Hon. Sec. *at once*, as it is intended to publish the Members' Roll in the May *Naturalist*. Street numbers are desired in all cases.

The Club year ends with this month. Any subscriptions overdue should be forwarded to the Hon. Treasurer *at once*.

The Victorian Naturalist.

Vol. XXXIX.—No. 12. APRIL 5, 1923. No. 472.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting was held at the Royal Society's Hall on Monday evening, 12th March, 1923.

The president, Mr. C. Daley, B.A., F.L.S., occupied the chair, and about fifty members and visitors were present.

CORRESPONDENCE.

From Mr. D. Best, thanking the Club for his election as an honorary life member, but declining the honour, as he felt that the Club required all the subscribing members it could obtain. He therefore desired to become a regular life member of the Club, and enclosed a cheque for five pounds as his membership fee.

From Mr. W. M. Bale, F.R.M.S., and Mr. F. Wisewould, thanking the Club for the honour done them in being elected honorary life members.

REPORTS.

A report of the excursion to Black Rock on Saturday, 24th February, was given by the leader, Mr. J. Stickland, who said that, though favoured by a beautiful day and a low tide at the right time, there was just sufficient sea raised by the wind to prevent any satisfactory work being done among the rocks. A search was made, however, for interesting objects out of reach of the waves, when quite an interesting series of objects was met with and discussed among those present.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. Willoughby Curtois, 7 Erskine-street, Malvern; Mr. Allan T. Latham, 26 Scott-street, St. Kilda; Mr. A. N. Lewis, "Wallington," Hotham-street, East Melbourne; Mr. V. Miller, High-street, St. Kilda; Mr. Walter J. Parr, 18 Bokhara-road, Caulfield; Mr. C. F. Argyll-Saxby, M.A., F.R.G.S., 182 Collins-street, Melbourne; and Mr. Joseph H. Woodward, 1 Rathdown-street, Carlton, were duly elected ordinary members of the Club.

GENERAL BUSINESS.

Mr. A. E. Keep referred to some correspondence that had passed between the Society for the Prevention of Cruelty to Animals, Mr. Latham, M.H.R., and the Minister for Trade and Customs, relative to the exportation of native birds. The Minister had given an assurance that as soon as possible the export of most of our native birds would cease.

Mr. C. Oke drew attention to the fact that more than one expedition was exploring in Australia for natural history purposes. He considered that the scientific societies of Australia should combine and urge the Commonwealth Government to prohibit the removal from Australia of any type of a new species, or, if they be removed for comparison with other specimens in other countries, that a guarantee be given that they would be returned to Australia.

PAPERS READ.

1. By Mr. H. B. Williamson, F.L.S., entitled "Our Alpine Flowers."

This took the form of an illustrated lecture, in which the author directed attention to the more notable plants growing at altitudes of 5,000-6,000 feet in North-Eastern Victoria, the character of the scenery of the high table-lands, and the appearance of the vegetation with which they are clothed.

2. By Mr. F. Chapman, A.L.S., entitled "On Concretionary Limestones in General and on Pebbles from Lake Omeo in Particular."

The author gave some account of the formation of these concretions. The nodules, on being sliced and prepared for microscopic examination, usually exhibit a nucleus, with the general structure composed of minute organisms. He illustrated his remarks by means of lantern slides.

3. By Mr. J. C. Goudie, entitled "Notes on the Coleoptera of North-West Victoria, Part IX."

The author dealt with the genus Heteronyx of the family Scarabidæ and those representatives of the Elateridæ, Rhipidoceritæ, Dascillidæ, and Malacordermidæ, which he had observed in the Sea Lake district, giving brief notes as to their occurrence, &c.

REMARKS ON EXHIBITS.

Dr. Geo. Horne, V.D., drew attention to the uses of some aboriginal implements exhibited from the Lake Eyre district, South Australia.

Mr. A. J. Tadgell called attention to three additions to the flora of Victoria made by him during a recent visit to Mount Bogong, North-East Victoria, and an extension of habitat of a Grampian plant. The new plants were a fern, *Cystopteris fragilis*, Bernh., syn. *Woodsia læto-virens*, Brittle Bladder-fern; *Erigeron pappochroma*, var. *oblongatus*, Benth.; and *Carex pyrenaica*, var. *cephalotes*, syn. *C. cephalotes*, Round-headed Sedge; while *Olearia ramulosus*, var. *communis*, syn. *O. ericoides*, now found on Mount Bogong, had previously been recorded only from the Grampians. He also called attention to a

specimen of *Epilobium confertifolium*, Alpine Willow-herb, from a height of about 6,300 feet, showing the cushion form of the plant and the very narrow twisted seed-vessels.

NATURAL HISTORY NOTE.

Mr. C. Oke said that when recently examining an ants' nest at Eltham he was surprised to see an ant come out of one of the entrances to the nest with a small shell, which it deposited on the mound outside. On looking round he found two more examples of the same shell. Thinking they might be a fossil form, he submitted them to Mr. F. Chapman, A.L.S., who recognized them as *Diola lauta*, A. Adam, and thought they had probably reached the locality in "shell grit," frequently given to fowls.

EXHIBITS.

By Mr. F. Chapman, A.L.S.—Concretionary nodules from Lake Omeo, collected by Mr. C. Daley, F.L.S.; concretionary nodules from Tarcoola, South Australia, from National Museum collection; also concretionary limestone from Pinnaroo, Victoria, obtained from Mallee Bore No. 7 at 4–8 feet from surface, and micro-photographs in illustration of paper.

By Mr. F. Cudmore.—Fossil teeth of sharks and rays, from the Table Cape (Janjukian) beds, Tasmania.

By Miss M. Guerin.—Salt from the Pink Lakes, Linga, North-West Mallee, Victoria; this salt has a distinctly pink tinge, easily visible in daylight.

By Dr. G. Horne, V.D.—Stone implements used by the aboriginals of the Lake Eyre district, South Australia, including scrapers used for fine work; drills; knives, mounted, and used for cutting off dead men's hair; hollow bone, in which two flies are enclosed, and then buried, in order to keep away flies, which are a terrible pest in the locality.

By Mr. C. Oke.—Marine shells, *Diola lauta*, A. Adam, found in meat ants' nest near Eltham.

By Mr. A. L. Scott.—Pitchstone from Ngongataka, Rotorua, New Zealand. The acid magma cooled before the various minerals had time to develop, the result being a dark, brittle glass. Some specimens crumble with even careful handling.

By Mr. J. Stickland.—A fine colony of hydrozoa attached to a seaweed; Acorn Shells upon the carapace of a crab; and foraminiferous sand, collected on Black Rock excursion.

By Mr. A. J. Tadgell.—Plants from Mount Bogong, referred to under "Remarks on Exhibits."

By Mr. H. B. Williamson, F.L.S.—Dried plants from Bogong High Plains, &c., in illustration of paper.

After the usual conversazione the meeting terminated.

EXCURSION TO BLACK ROCK.

Ten or twelve members of the Club visited Black Rock on the afternoon of Saturday, 24th February. As the day was beautifully fine and the tide well out, conditions seemed all that could be desired; but unfortunately a stiff breeze made the sea so rough that no work could be done on the seaward side of the rocks. However, we placed a liberal interpretation upon our commission to study shore-life, and bestowed considerable attention upon organisms found upon the shore, although not dwellers there. At the end of the afternoon we had found representatives of most of the lower forms of marine life. To commence with the lowest group, the Protozoa, a tuft of fine filamentous seaweed growing in a tide pool furnished two or three species, including many specimens of the beautiful little loricate form Cothurnia, while a collection of white sediment from the ripple marks on the sand-banks was found to contain forams. A higher group, the Porifera, was represented by the skeletal remains of quite a variety of horny sponges. The phylum Cœlenterata comprises those animals which may be described as being little more than digestive sacs surrounded by tentacles. This phylum had examples in the shape of the beautiful hydrozoon of the Plumularia type (exhibited on the table) and numerous sea anemones and corals. The hydroids are of particular interest, supplying as they do many examples of alternation of generation of a remarkable type. The hydriform persons are asexual, while the sexual generation is of the form of a medusa, or jelly-fish. Several species of Crustaceans were noted, such as sand-hoppers and crabs. The diminutive tail part or abdomen of the latter, it was pointed out, constituted them examples of the Brachyura, or short-tailed crustaceans, as distinguished from the Macruran or long-tailed section, such as the crayfish. That extremely interesting crustacean, the Acorn Shell, which is sometimes to be had, was sought for in vain. These might easily be taken to be molluscs, but in reality they belong to the Entomostracan division of the Crustacea. In their juvenile stage they are free swimmers, but as age advances they settle down, attaching themselves by their heads, and form shells, from which they extend their feet to catch food. An example of these will be seen on the table which have built their residences upon the carapace of a crab, doubtless without asking permission. Worms were plentiful. Spirorbis, which builds a tiny spiral tube of almost microscopic dimensions, was noted, while another beautiful tube-dweller, Serpula, was, of course, in evidence everywhere. A univalve mollusc was found with its shell completely covered with the tubes of the little builder just mentioned. On being placed in a bottle of water the

mollusc began its travels, while the Serpulæ extended their plume-like gills, to the pleasure of all beholders. Another much larger polychæte worm, in the shape of a species of Nereis (probably), was also found. Polyzoa or Bryozoa had one example. These are classed as worms by some authorities, and as allied to molluscs by others, being called Molluscoidea. Molluscs, of course, were plentiful, including the curious form Chiton, which has its shell divided into eight plates, which gives it a certain amount of flexibility. Of the interesting groups Tunicata and Echinodermata no representatives were found on this occasion. Had there been rough weather a day or two before our visit took place, probably numerous tunicates would have been thrown up on the beach. It seems to us that the number and variety of marine organisms to be taken on the shore near Melbourne is very much less than in days gone by. Pholas, that interesting rock-boring mollusc, and some others we have not found for many years. Marauders in the shape of thousands of holiday-makers are doubtless to blame.—J. Stickland.

"Australian Science Abstracts."—The third number of this journal (for February, 1923), published quarterly by the Australian National Research Council, is to hand. It contains brief abstracts of papers published in various Australian societies' proceedings, &c., during the quarter, embracing agriculture, botany, chemistry, geology, mining, pathology, veterinary science, zoology, &c., and should prove very useful to workers both in Australia and elsewhere. The subscription price is 4s. per annum. It is obtainable from the editor-in-chief, Dr. A. B. Walkom, D.Sc., 23 Ithaca-road, Elizabeth Bay, Sydney, N.S.W.

Forests Commission of Victoria.—The third annual report of the commission for year 1921–2 has the somewhat unique distinction of being printed on paper manufactured from pulp containing 67 per cent. soda pulp, made from Victorian timbers —viz., Mountain Ash, *E. regnans*, Woolly-butt, *E. delegetensis*, Messmate, *E. obliqua*—and 33 per cent. imported "sulphide" pulp. The paper was supplied by the Institute of Science and Industry, which has been conducting experiments in the manufacture of paper from Australian woods at the mills of the Australian Paper and Pulp Co. Ltd., Fyansford, near Geelong, these experiments being subsidized by the Forests Commission of Victoria. The paper seems to be of excellent quality and good colour. The report states that one million and a quarter conifers were planted out during 1921, with about 50,000 eucalypts and other trees.

THE MEASURING OF TALL TREES.

(WITH PLATE.)

BY A. D. HARDY.

(*Read before the Field Naturalists' Club of Victoria, 16th Jan.*, 1923.)

OWING to misstatements and doubtful records recurring in print, I am again bringing under your notice the subject of tall trees—this time chiefly with special reference to the method and difficulty of obtaining their heights.

It is unfortunate for students of natural science generally, and tree-lovers in particular, that science periodicals are little read by other than members of the societies which produce them. Technical treatment of the various subjects is at times quite necessary, but unless there is a fair amount of journalistic leaven in the literary dough the volumes, bound or unbound, rest solidly on the library shelves. When one seeks through such a medium to render innocuous the errors far-flung by means of flamboyant articles in popular journals and magazines so readily obtainable at the local news agency or railway bookstall—magazines attractively gotten up and profusely illustrated, so as to be transferred from hand to hand until too tattered for use—the handicap is severe. But we are sorely smitten when official or semi-official publications—with title and general tone suggesting a sense of responsibility, and with a wide circulation both in the country of origin and abroad—get a good start with erroneous or doubtful information; or we are left dissatisfied with the omission of reference to data or its verification.

In a paper entitled "The Tall Trees of Australia," read before this Club in March, 1918 (*Vict. Nat.*, xxxv., p. 46, July, 1918), I drew attention to the fact that our tall tree height records were those of trees that had long since passed away, either through the action of incendiaries or through the subordination of sentiment in the interests of forest utilization, and that we had a poor showing against the preserved giants of California, many of which, however, are on private property, and may be converted into lumber.

Here are two extracts—the first from the letter of one of my American correspondents soon after his return from a visit to Australia, the second from a widely-circulated forestry periodical (in both cases the italics are mine):—

(1) "Referring to your article on the big trees of the world, I wonder if you saw an article in the *National* (U.S.) *Geographic Magazine* for July, 1909—'The Tallest Tree that Grows,' by Egerton R. Young, describing the eucalypts of Australia, in

which he states that *specimens of Eucalyptus amygdalina* * *reach a height of* 480 *feet!* He says *specimens over* 400 *feet are frequently found* (if so, I should like to find some). I would be glad to have your comment on this article if you can find a copy." In a later issue of the same journal (for December, 1916) Prof. H. E. Gregory ignores the references quoted above and gives 346 feet as the highest recorded Australian tree. Cornthwaite's measurement of 375 feet had, however, not been published at the time.

(2) By Mr. Detwiler, June, 1916:—"The average diameter of a fully-developed Sequoia is 25 feet. . . . At least one Sequoia has been cut down whose diameter was almost 31 feet. . . . . That tree was 302 feet in height. The average height is 275 feet, but *a few attain* 350 *to* 400 *feet.* Still, the Sequoia is not the tallest tree in the world, though it is by far the largest or most massive. *The Eucalyptus trees of Australia exceed it in height,* but are more slender." (Muir's "500 feet high are not uncommon" for Sequoia seems thus discounted, but I should be glad of verification of Detwiler's "400 feet.")

The circulation of the former magazine is easily 100 times greater than that of the *Victorian Naturalist*—probably 1,000 times as great in America. It may seem a little incongruous that at least two American writers should conscientiously endeavour to hand the prize for tall trees, so coveted by their countrymen, to Australia, and that an Australian should disclaim our right to accept it. True, I have been reproached by many for "belittling the Eucalypt," but it would be unwise to allow well-meaning protagonists of the Sequoias to so advertise fictitious heights for *Eucalyptus regnans* that, when called upon some day to "produce the goods," we should be unable to point to anything much over 300 feet. In the absence of a disclaimer, our silence might be taken as equivalent to consent.

Let me briefly refer to four trees (now gone into lumber, palings, or smoke) of excessive height, whose dimensions were obtained by measurers of undoubted ability; trees of the splendid past, all of the species *Eucalyptus regnans* (Mountain Ash), and all Victorians.

RELIABLE RECORDS OF HEIGHTS.

1. Mount Dandenong; G. W. Robinson, C.E.; 342 feet to broken 9-inch diameter top; estimated total height, 360 feet.
2. Thorpdale, Gippsland; G. Cornthwaite, L.S.; 375 feet.
3. Olangolah, Otway Mountains; Colac Shire Engineer; 329 feet to the broken top.

* *E. regnans.*—A. D. H.

4. Mount Baw Baw, Gippsland; Cunningham, L.S., Pierce, C.E.; 326 feet 1 inch (the apparently absurd "1 inch" being due to exact mathematical calculation, and points to the meticulous care of the surveyors in recording).

I purposely omit reference to bulk, girth, &c., as it is the height measurement and its difficulty that I am bringing under notice this evening, hoping that members and others whom my hints may reach will exercise due care in ascertaining and caution in publishing figures that would be of interest not only in Australia, but in other countries.

METHOD OF MEASUREMENT.

Nothing less than a theodolite and 1/16 inch steel tape controlled by a person certified as competent to use them is a satisfying condition in this matter, since the tallest tree record is the subject of international competition, with the United States slightly in the lead, and the difference between the points ultimately gained by the contestants, whichever succeeds, may be very small. The rigidly-set theodolite and a steel tape long enough to reach from the instrument to the tree—that is, a five-chain tape to reach between the vertical axes of instrument and tree, with a vertical angle of 45 degrees or thereabouts employed—give ideal mechanical conditions; but in densely-forested mountainous country the carrying of such a heavy load requires much enthusiasm on the part of the measurer, or a considerable survey fee. However, we remember the recipe for "jugged hare"—"First catch your hare." The search for the tall eucalypt may be done with a clinometer and tape. There are various other handy instruments, such as the hypsometer, dendrometer, and contrivances of various sorts, all more or less inadequate. In the hands of one experienced in its vagaries and its use, the aneroid barometer might be used on a steep slope, provided the upper station were of even altitude with the tree top; but it is difficult to read less than 5-feet differences, and in any case an allowance of 3 per cent. to 5 per cent. or more of error for short-height intervals puts this instrument out of court for our purpose.

I am not conversant with the special aneroid used by Abercrombie for the measurement of heights of ocean waves, but, as it indicated differences of from 1 to 2 feet, such an instrument might be used for tall trees. Another method theoretically possible, but almost impracticable, would be the use of the Dumpy level, by which an ascending or descending series of sectional heights could be obtained, giving in the aggregate the height of the tree; but this would involve a tremendous amount of clearing, and, further, the chance of disturbing the

PLATE V.

"THE BARON,"

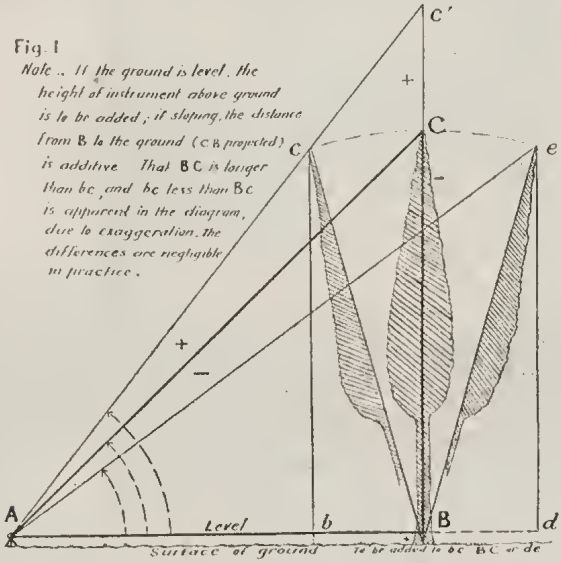
A giant eucalypt, *E. regnans*, formerly standing near the junction of Perrin's and Sassafras Creeks, Dandenong Ranges.

instrument at any of the many stations required between the adjustment and the first observation, or between complementary observations, owing to the difficulty in obtaining rigidity for the tripod or secure footing for the operator, disqualifies this method also.

Let us suppose that our spies have reported the locality of a tree the like of which has never been heard of. Incredulous, though not without cause, we decline to burden ourselves with unnecessary impedimenta, and approach the big vegetable with axe, steel tape, clinometer, pocket book and pencil, and perhaps the essentials of a temporary camp have to be packed and carried. Arrived at or near the tree, we find, in all likelihood, that it stands amid a dense lower story of the forest flora perhaps reaching 40 feet in height, and comprising Musk, Hazel, Christmas-bush, Blanket-bush, Stinkwood, Blackwood, and with Correa, Clematis, Lyonsia, wire-grass, and fern compacting the ground cover.

This is well illustrated in the accompanying plate, which shows "The Baron," a tall tree which at one time grew in the Dandenong Ranges, near the junction of Perrin's and Sassafras Creeks, whose height was recorded at 219 feet 9 inches to the broken top. I am indebted to the Forest Commission for permission to make use of this illustration.

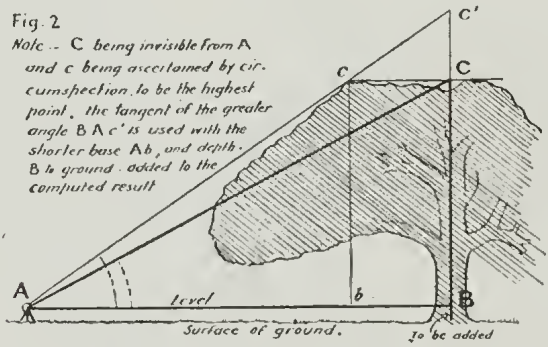
As we cannot see top and bottom of such a tree at the



same time, we get to work with the axe, or, if we have had previous experience, several axes. Having cleared a narrow lane for visibility and footway for chainage, we next

set about measuring the vertical angle and the base line. To measure the angle seems simplicity itself, and is so with an instrument in perfect adjustment, properly set and levelled, if we can see what we want. This is just where the main difficulty comes in. By means of a few diagrams I hope to demonstrate that to exactly measure the height of a tall, old eucalypt is almost impracticable with ordinary surveying methods and appliances, and from what I have seen of old Sequoias in photographs the remark applies to that genus also.

Theoretically, we obtain the ratio of a right-angled triangle, of which we measure the base and compute the perpendicular, which latter, under ideal conditions, coincides with the axis of the tree; but the coincidence rarely if ever happens, the chances being more than 100 to 1 that the ground is sloping in the most convenient sighting position, and that the tree-top is not exactly over the bottom. So the measurement of a lower as well as an upper angle is necessary, as well as much manœuvring and some computing to obtain the theoretical summit of the tree's axis, the length of base to be measured to correspond with the top of a symmetrical but leaning tree, or to correct for an observation to a point neither the physical top nor theoretical top, but a twig or branch end, the only sighting point available (see figures 1 and 2, angles BAc, BAC, or BAc).



If with clinometer and tape, and with due precautions, we find that the tree is apparently over 300 feet, it is worth while to return later with a theodolite. If we remember that 1 degree of difference in a vertical angle of about 45° means 3.5 in 100 units of lineal measurement, or, say, 10 feet in the height of a 300-foot tree, we will exercise extreme care in setting up the instrument, and this care is a moral obligation if we are out to break previous records or secure others worthy of preservation and to withstand criticism. By circumspection we may to some extent choose a better *point d'appui,*

and so eliminate part of the error due to eccentricity of the tree-top, and the balance may be reduced by a supplementary observation at right angles to the first to obtain the distance *Cc* or *Ce* (figure 1) respectively as the tree leans to or from the first station of observation, for correction of the base measurement, or by further computation of the small triangle at top of tree arrive at further data for correction of the height. If you imagine the rectilinear part of figure 2 applied to a tree such as a River Red Gum, *Eucalyptus rostrata*, the trouble in sighting the top of a tree of other than pyramidal habit will be apparent.

Now, I have pointed out only some of the principal difficulties —viz., locating the tree, clearing the site, centering the top, obtaining a secure footing for the theodolite in the spongy mulch of many years' accumulation of rotted leaf, twig, and bark, all soft, damp, and yielding in that shaded place.

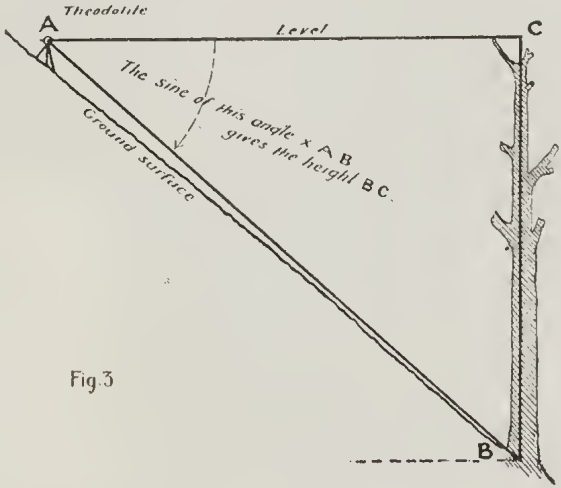


Fig.3

Alternatively, on a steep hillside, with obstacles in the way of lateral attack, we might locate, by the trial and error method, a spot on the mountain side opposite the top of the tree for the levelled telescope, and then by depression obtain (1) the vertical angle measured downwards, and (2) the length by chainage between the vertical axes of the theodolite and the tree at its base, thus providing data for a different computation (figure 3), in which the sine of the angle CAB is used.

Having heard of some of the difficulties supposititiously encountered on the site, you will, I feel sure, hear with interest an account by a backwoodsman who guided a survey party to a tree on Baw Baw. Mr. Dowey, now an officer of the

Forests Commission of Victoria, was then engaged in paling splitting in the Gippsland forest. From the story which he kindly put in writing for me a few years ago the following is extracted :—"Myself and brother, accompanied by Messrs. Cunningham and Pierce (surveyor and photographer), started from Neerim early one June morning in the year 1888. Crossing the Latrobe River, we travelled twelve miles up the ranges (Baw Baw). The country was at that time covered with thick Stinkwood * and Horizontal Scrub.† We took with us a light lunch (expecting to be back the same night), a fairly large camera, and some 'slashers.' Reaching the Mountain Ash belt late in the evening, we found nearly two feet of snow covering the ground ; the altitude about 3,000 feet. It being nearly night, we decided to make the best of matters and camp. We had no covering of any kind and no food. Setting fire to an old hollow shell, we sat or stood round the fire till daylight. The cold was intense. We found a tree close to our camp and took the measurements. (Later, when the belt was opened up, I saw much higher trees.) Starting back down the mountain, Pierce, who had lately come from England, was getting very exhausted with the night's exposure, and we each had to assist him on the weary journey back, reaching Messrs. Ross's selection about dark. Everyone was about done. This particular belt of Mountain Ash contained about 300 acres, and was named by paling splitters 'New Turkey.' Messrs. Ross treated us very kindly. I have not seen the two gentlemen (Cunningham and Pierce) since, but I am quite sure that both, if alive, will never forget their experiences on that occasion." Mr. Dowey naively adds :—"This belt of Mountain Ash was opened up by paling splitters (self included) some three years later, and turned out one of the best belts of timber in that mountain country. The particular tree that was measured was split up for palings, and turned out about 6,000 six-feets."

Now a remark or two as to estimating—not guessing. By this I mean a rough result obtained without instruments. The pencil method employed by landscape painters and other artists to obtain proportion is applicable to inconsiderable heights where precision is not essential. Where the height is great and the result desired is to be near the mark, the endeavour is defeated by the fact that in raising the pencil hand there is described an arc which, the higher the hand goes, is, if the pencil be kept at right angles to the line of sight, swung until, if continued, it is in a line with the zenith, and all intermediate positions are proportionately productive of error. The pencil cannot be kept with axis transverse to line

* *Zieria Smithii.* † *Correa Lawrenciana.*

of sight and at same time parallel with axis of the tree, and if kept parallel is seen more and more obliquely with each successive vertical section of the tree measured, the increasing error, being in excess, gives too tall a tree.

Stepping or Pacing the Length of a Fallen Tree.—I was told that this is "as easy as falling off a log"; but it is not easy to fall off a log deliberately—let anyone try it. Even surveyors, who are daily relying on accuracy in pacing to locate old pegs, &c., would not claim accuracy greater than 2 per cent., or substantiate the claim if made, even on level land. Imagine, then, the stepping on a slope littered with the original *débris* of the forest floor, and with the tangle and canopy of the fallen giant added. Such a task is easily performed by one in an office chair, or seated on a fence rail, by means of a vivid but treacherous imagination. Recently I had an opportunity of watching a number of men, who had gathered from various mountain sawmills in the locality, competing at holiday sports. One event was the stepping of 66 feet (1 chain's length). Each contestant stepped his twenty-two yards and thrust a long nail into the ground. At the finish the standing nails were distributed much like bowls on a green, with the "kitty" absent. When the objective point was located by tape measurement it was found to be about midway between the longs and the shorts, which together extended over 15 feet. What sort of tree heights would the short-steppers, who predominated in proportion 5 : 3, return conscientiously enough from a like effort to obtain three hundred feet of tree length on bad footway? The contestants were men of mixed nationality and of varying age.

In my earlier article I did not state or imply doubt as to the good faith of recorders of phenomenal measurements, but rather questioned their methods or deplored their over-credulity in listening to others. In most cases the information was second or third hand. I would rather accept a bushman's statement that a tree in one locality was taller than another elsewhere than attach undue importance to its being so many feet high, and we may note Mr. Dowey's statement that he subsequently saw much taller trees (than the one measured and recorded as 326 feet)* in that locality.

Convergence of opinions of old bushmen, such as cattlemen, splitters, tin-mining fossickers, &c., and surveyors, leads one to believe that the move in 1888 to secure big tree measurements came too late, the tallest trees having been already converted into palings. Our great grandchildren may have a remote chance of seeing what our grandfathers saw if sufficient

* A distant view of this tree was given in the *Gum Tree* for June 1921, from a negative in the possession of the Forest Commissioners.

areas be held in reserve for the growth and development of trees in favourable localities. *Eucalyptus regnans* continues its upward growth after it is capable of yielding merchantable timber, and the unsympathetic individual, who can be found not only in the splitters' tent, the graziers' homestead, or the sawmillers' camp, but also in higher places, should be warned by *us*—the people, the owners of the trees—to keep sacrilegious hands off such magnificent specimens of the Creator's work.

Perhaps I may be thought maudlin in the opinion of some folk when I express or harbour the feeling that when a tree of over 300 feet describes an arc of the landscape, first with an ominous cracking and rending of fibres at the cut stump, then with a sigh above that becomes (with the tree's descent) the sound of a hurricane wind, and next the tearing and crashing through the undergrowth that ends in a great smashing blow on the ground and a bounce up of a few feet, perhaps, before all is quiet save for the fluttering of the glossy leaves of the twig tips for a moment longer—then it seems that murder has been committed. The awful silence which follows in the forest is broken by the sound of axe and saw dismembering the carcass, the boards from which may presently provide a dancing floor or a coffin for one's self. We kill the ox and the sheep for food, leather, and wool, and we rear them for such; we asphyxiate or pole-axe the useless dog and cat, either to put them out of their misery or to prevent a public nuisance or a menace to our health; but we do not, utilitarians though we be, stick a knife into the pet sheep's throat nor poison the old dog except for pity's sake. Our sentiment disallows it. Is it only the artist—pictic or photographic—or the poet, the naturalist, and other such "cranks" that will strive for the protection of and decry the destruction of these gigantic forest growths?

We have heard a great deal in the past of the striving for the "almighty dollar," but we live in a glass house, and should avoid stone-throwing; there is such a thing as the almighty pound sterling, for a surplusage of which some folk would sacrifice their souls. Dollars or no dollars, our American cousins can "produce the goods" when asked to point out their giants. What can we do in return but point to axe chips or burnt stump ashes and say, "There was a great tree! I remember, &c.," or produce a photograph, or a copy of the *Victorian Naturalist*, the *Gum Tree*, or an old *Leader* or *Australasian*, showing the long-deceased "Big Ben" or "Uncle Sam." We can even produce a photograph of part of "King Edward VII.," and show that it *was* 80 feet round at 10 feet and 112 feet at the ground.

If we will not measure and treasure for ourselves, at least let us reserve the material necessary for the enthusiasm, enjoy-

ment, and interest of future generations of men more appreciative, surely, than ourselves. I am not, of course, referring to legitimate and economic forest work, but to the unnecessary killing of the great and beautiful in select places.

THE GOLD COAST, WEST AFRICA.—The director of the Gold Coast Geological Survey, Mr. A. E. Kitson, C.M.G., O.B.E., in his report for 1921, recently to hand, states that, while no discovery of outstanding value has been made, steady progress in determining the geological features of the Colony is being accomplished, notwithstanding the difficulties of the climate, &c. Included in the staff is Mr. O. A. L. Whitelaw, also a former member of the Victorian Geological Survey staff.

A FERN NEW FOR VICTORIA.—During a recent trip to Mount Bogong, Mr. A. J. Tadgell collected a fern growing among the rocks near the summit which proved to be *Cystopteris fragilis*, Bernh. This fern has been recorded from Tasmania and New South Wales, and, like several other alpine plants, the connecting locality, Victoria, is now recorded. Bentham's description of the genus is:—Delicate ferns, limited to the colder mountainous regions of both hemispheres. Sori small, circular, on under surface, enclosed when young in a thin globular membrane which opens into a cup. The description of the species is:—Root-stock creeping, fronds tufted, in general outline oblong lanceolate, twice pinnate, stalks slender without scales, segments lanceolate, deeply pinnatifid, lower pinnate lobes obtuse. Fronds four to eight inches. This fern is known as the "Brittle Bladder-fern," and was formerly listed as *Woodsia læto-virens*. It is cosmopolitan in its occurrence, always at high altitudes.

"EUANCONDIT."—In 1895 "Henry Goldsmith" (Mr. Armstrong), a solicitor of Kyneton, published an Australian novel under the above title, "Euancondit," being the name of the heroine of the book. When in Kyneton recently I found that this was the accepted vernacular name in the district for the Fairy Waxflower, *Eriostemon obovalis*, and on making inquiry was told that it was the aboriginal name for that flower. The following extract from Mr. Armstrong's book is interesting:—"To them she was always Euancondit—the pure white little flower of the hills. It was the native name of a little, rare, white waxflower that grew in small sprays in the gullies and gulches of the mountains, and this name they (*i.e.*, the blacks) applied affectionately to her as characteristic of her appearance and manner. They knew her real name was Katie, but never called her by it. To them she was always the little white flower of the mountains—Euancondit."—E. E. P.

ALPINE ORCHIDS.—At the February meeting of the Club Mr. A. J. Tadgell exhibited a number of Alpine plants he had recently collected on Mount Bogong, Victoria's highest mountain, at an elevation of 5,800 to 6,400 feet. Among them were several orchids. Dr. Rogers, of Adelaide, to whom duplicate specimens were sent, writes as follows :—"The Mount Bogong orchids proved exceedingly interesting. Although many of the specimens carried badly, I was able to determine several of the Prasophyllums without difficulty. In addition to *Thelymitra venosa* and *Chiloglottis Gunnii* your parcel contained examples of *Prasophyllum Suttonii* (the connate sepals variety), and *P. Frenchii*, var. *Tadgellianum*. I am inclined to think that the latter should rank as a distinct species."

MACQUARIE ISLAND.—In July, 1918, a somewhat spirited discussion took place at a meeting of the Field Naturalists' Club with regard to the bird life of Macquarie Island, a desolate speck in the Southern Ocean, about 900 miles to the south-east of Tasmania, and under the control of that State. In the *Papers and Proceedings of the Royal Society of Tasmania* for 1922 Sir Douglas Mawson, Kt.B., D.Sc., O.B.E., gives some account of the island, and discusses its animal and bird population, illustrated by a map and several plates. He comes to the conclusion that the best use that can be made of the island is to proclaim it a "National Faunal Reserve." Some idea of the quantity of life on the island is given by the fact that during an average season 700 sea-elephants and 300,000 Royal Penguins are killed and the oil extracted from their bodies, but this terrible slaughter is having its effect on the rookeries, hence the desirability making the island a strict sanctuary, more especially in view of the fact that the revenue derived from all this butchery is only about £20 per annum.

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OUR FORTIETH VOLUME.

WITH the next issue of this magazine (May, 1923) it enters on its fortieth year and must be considered quite aged as such publications go, especially in Australia. The committee of the Club has had under consideration for some time the possibility of making the magazine more useful and more attractive even than it has been, and with that view it is proposed to enlarge the publication regularly to twenty-four pages by including special sections for notes (with illustrations) about birds, insects, pond-life, &c., &c. To keep these sections going depends almost entirely on the members of the Club. No editor, whoever he may be, can provide pages of notes of a readable nature unless the facts are furnished to him by reliable witnesses. It therefore falls upon the shoulders of every member of the Club to do his or her bit in carrying out the desire of the committee.

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